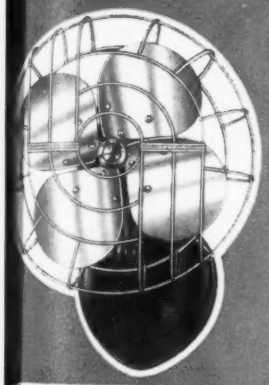
JUNE, 1940

ELECTRICAL SOUTH

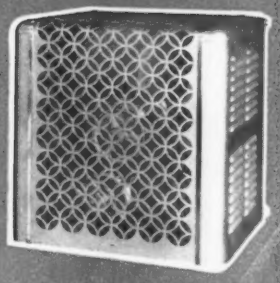
UNIV. OF FLORIDA

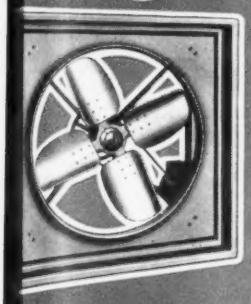


HUNTER engineers continue to develop additional cooling systems and ventilating devices to go with their long established line of desk, ceiling, and pedestal fans.

The new window coolers which are adaptable for homes, apartments and hotels, are of the most quiet and non-vibratory type yet produced.

Write or wire for scientific information which will be promptly mailed without obligation.





HUNTER FAN & VENTILATING CO., Inc.

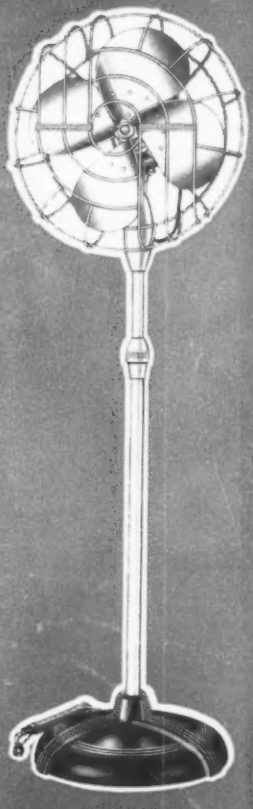
Factory: FULTON, N. Y.

General Sales Offices: Memphis, Sterick Bldg.

Eastern Sales Office: New York, 92 Warren Street

Sales Offices:

ATLANTA
BOSTON
CHICAGO
CLEVELAND
DALLAS
DAVENPORT
DETROIT
HOUSTON
KANSAS CITY
LOS ANGELES
NEW ORLEANS
PHILADELPHIA
PITTSBURGH
ST. LOUIS



HUNTER Century

—AND BY ITS HOLDING POWER

YE SHALL KNOW THE ANCHOR!

• HUBBARD STEELWING ANCHORS AND HUBBARD HERCULES EXPANDING ANCHORS ARE "CHAMPS," POUND FOR POUND, AREA FOR AREA, FROM THE "BANTAMS" TO THE "HEAVIES."

EXTRA STRENGTH · GREAT ENDURANCE

EASILY INSTALLED

HUBBARD AND COMPANY

PITTSBURGH . . . OAKLAND CALIFORNIA . . . CHICAGO

"HANG THE LOAD ON HUBBARD HARDWARE"

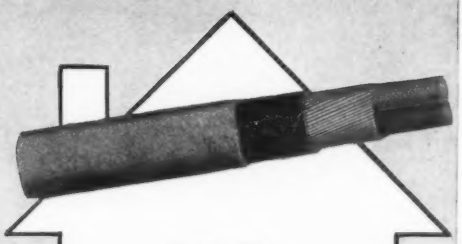
STYLE ABN
(ARMORED BARE NEUTRAL)

makes possible low cost service entrances because cable may be strapped to the house. No conduit is required. Style ABN is manufactured with a flat galvanized steel tape applied with a minimum spacing to resist mechanical injury and prevent damage by rodents.

Eliminate Bottlenecks

with HAZARD SERVICE ENTRANCE CABLES and HAZAKROME Type SN

Small Diameter Building Wire



STYLE UBN
(UNARMORED BARE NEUTRAL)

made without the steel armor of Style ABN, this cable is provided with a heavier double wrapped tape cushion underneath the outer braid and the concentric conductor contains a greater number of wires wrapped more closely, thereby making it diversion proof.

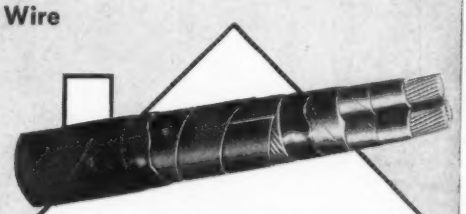
CONCENTRIC TYPE SD
DROP CABLE

combines the advantages of small dimensions, light weight and efficiency. Can be used to carry entrance circuit from pole to house Entrance Cable or by use of single hole entrance cap and rigid conduit it may be continued to meter or entrance switch. Supplied in two or three conductor constructions.

Write today for

HAZAKROME HANDBOOK

It tells how to use, install and sell HAZAKROME Type SN for rewiring existing raceways to obtain increased circuit capacities.



ARMORED SERVICE
ENTRANCE CABLE

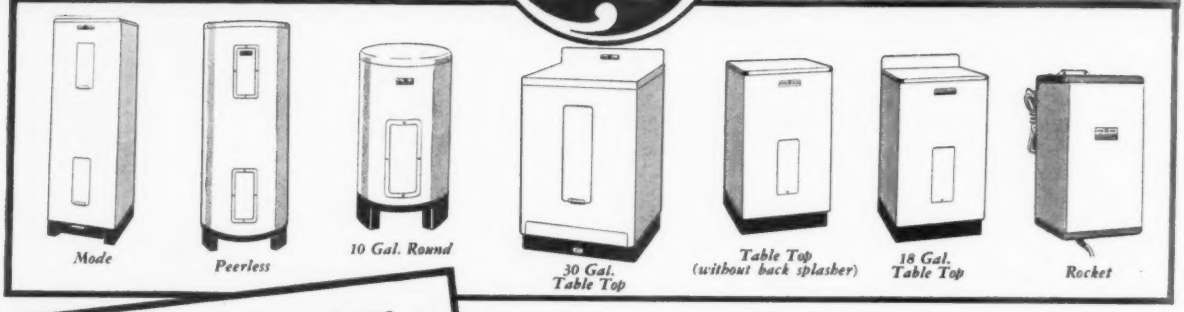
consists of two or three Hazard submarine rubber insulated and braided or taped conductors protected against moisture and mechanical injury by multiple layers of pre-saturated jute, non-metallic armor tape and plastic sealing compound. Hazard Armortite Cable is light in weight, easy to handle and moderate in cost.

HAZARD INSULATED WIRE WORKS

DIVISION OF THE OKONITE CO.
WORKS: WILKES-BARRE, PENNSYLVANIA

New York Chicago Philadelphia Atlanta Pittsburgh Buffalo Boston Detroit Seattle
Dallas Washington Cleveland San Francisco St. Louis Los Angeles

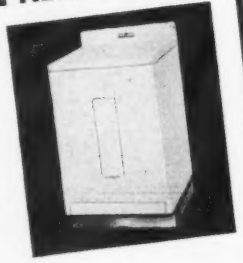
ELECTRICAL SOUTH is published monthly by W. R. C. Smith Publishing Co., Marietta, Ga., and Atlanta, Ga., U. S. A.
Subscription rates United States and Possessions $1.00 for one year; $2.00 for three years; Canada $1.50 per year; Foreign Countries $2.00 per year
Entered as second class matter at postoffice, Marietta, Ga., under Act of March 3, 1879.
Volume 20 Number 6



POPULAR NEW MODELS THAT PROMISE NEW BUSINESS

Model G-307

30 gal. capacity. Popular table-top design. Styled to match modern electric kitchen base cabinets and appliances.



Model G-101A

10 gal. capacity. Especially suited for commercial purposes as well as for small homes, auxiliary use, etc. Low-priced.

The great new line of General Electric Water Heaters is *complete*—with sizes and types for every requirement—from 2 to 140 gal. capacities—including popular-priced models for special promotions. And every G-E Water Heater has the famous CALROD *immersion type* heating unit, plus many outstanding features that SELL.

A new and complete array of sales promotion "props" and plans are ready to help you win new business. Call in your G-E Distributor today and look 'em over!

See This New and Utterly Different Water Heater Sales Manual!

Nothing else like it. Dozens of "how to sell" illustrations take the place of dry text matter. A complete sales course in "picture-book" form! Phone your G-E Distributor for a copy *now*.

General Electric Co., Appliance & Mdse. Dept., Bridgeport, Conn.

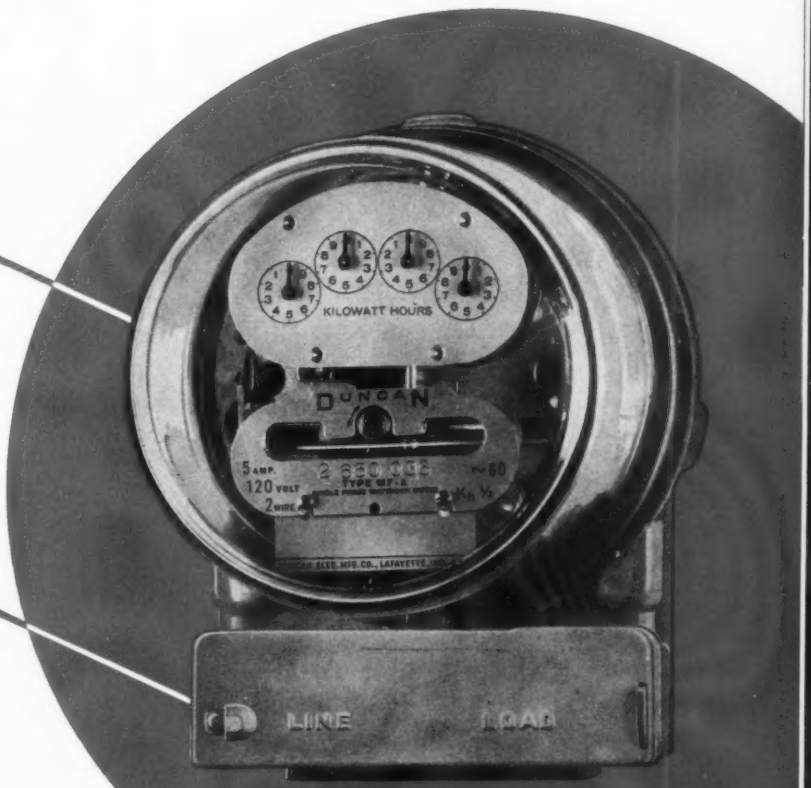
GENERAL ELECTRIC

3 REASONS WHY– DUNCAN DESIGNED METERS are *Built to stay Modern!*

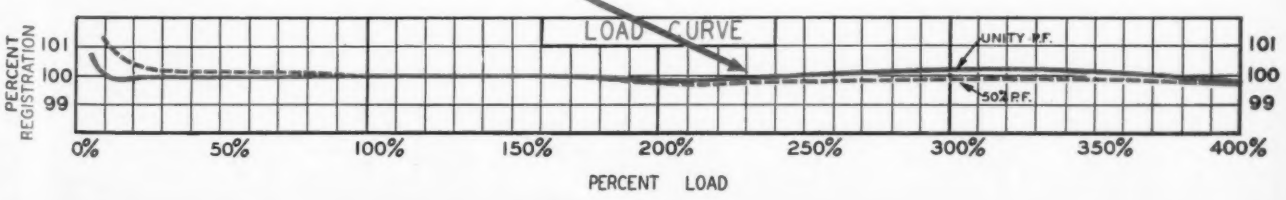
ALNICO MAGNETS

PORCELAIN TERMINAL BLOCKS

WIDE RANGE ACCURACY



For complete details, write for Bulletin 158



DUNCAN ELECTRIC MFG., CO.
LAFAYETTE, INDIANA

Walter V. Gearhart Co., Southeastern Representative

Every house needs
Westinghouse
HERE'S HOW I
PAVE THE WAY
FOR MANY A WATER HEATER SALE!
..hot water HELPS
FIRST: I see that every one of my good prospects gets a copy of the new Westinghouse "Hot Water Helps" Book. There's a mailing that women read because it gives them dozens of helpful household and beauty hints . . . all using HOT water, of course. Then I call on these prospects, and . . .
I SAY: How are you, Mrs. Jones. Have you read the new "Hot Water Helps" booklet we mailed you a few days ago?
SHE SAYS: Yes . . . and I'm keeping it, too . . . it's just full of helpful suggestions. Why, I never dreamed hot water could help in so many ways! Only, it set me to wondering about 140° HOT water. You see, with our old heater . . .
THEN: I sail into my story on Westinghouse Electric Water Heaters. And I get to the dotted line in a hurry! That "Hot Water Helps" Book has done a beautiful job of selling Mrs. Jones on the importance of having plenty of 140° HOT water, and on the fact that she's got almost what it takes to get it at low cost with a Westinghouse. It sure paves the way for easier, quicker water heater sales!

TRY THIS NEW APPROACH TO EXTRA PROFITS

Every woman wants to be more beautiful. Every woman looks for easier ways to keep her home neat and attractive.

The "Hot Water Helps" Book gives your prospect what she wants—beauty and health hints, short cuts to easier dishwashing, house cleaning, cooking. The book is practical, authentic, prepared with the help of famous women's magazines.

And every helpful suggestion sells the need for plenty of 140° HOT water!

That's why your prospect is **easier to close** when you show her how economically a Westinghouse will give her the 140° HOT water she needs!

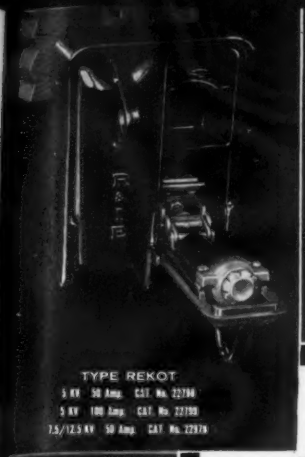
It's a new approach to water heater selling, built into a plan that's ready to boost profits for you beginning right now. Get the details from your distributor, or write Westinghouse Electric & Mfg. Co., Merchandise Division, Mansfield, Ohio, Dept. 141.

TUNE IN "MUSICAL AMERICANA", EVERY THURSDAY EVENING, N. B. C. BLUE NETWORK

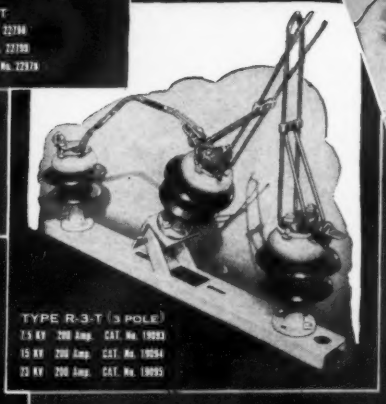
Westinghouse Home-proved Water Heaters

"The Line of Least Resistance"

1940

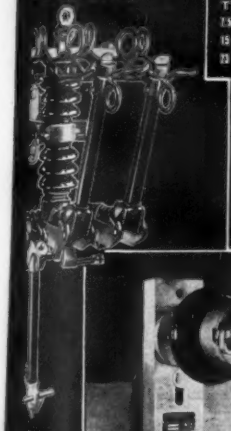


TYPE REKOT
5 KV 50 Amp. CAT. No. 22784
5 KV 100 Amp. CAT. No. 22785
7.5/12.5 KV 50 Amp. CAT. No. 22976



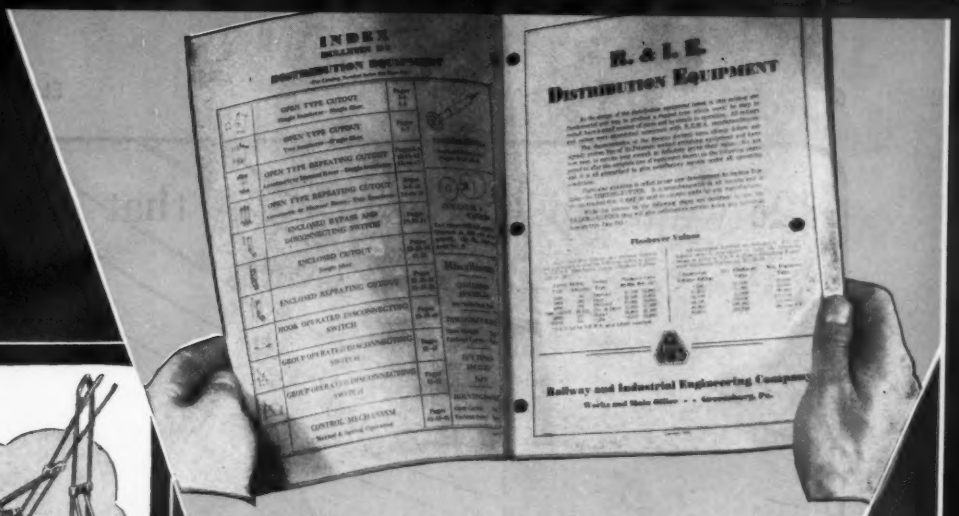
TYPE R-3-T (3 POLE)
7.5 KV 200 Amp. CAT. No. 19093
15 KV 200 Amp. CAT. No. 19094
23 KV 200 Amp. CAT. No. 19095

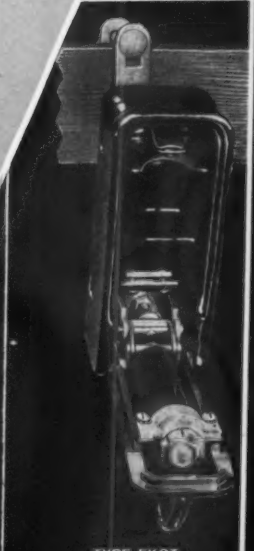
TYPE RKOT-3
100 Amp. CAT. No. 23626
100 Amp. CAT. No. 23628
100 Amp. CAT. No. 23630



TYPE 2KOT
7.5 KV 100 Amp. CAT. No. 19081
15 KV 100 Amp. CAT. No. 19082
23 KV 100 Amp. CAT. No. 19083

TYPE KOT
5 KV 100 Amp. CAT. No. 19061
7.5/12.5 KV 100 Amp. CAT. No. 19062
15 KV 100 Amp. CAT. No. 19063





TYPE EKOT
5 KV 50 Amp. CAT. No. 20919
5 KV 100 Amp. CAT. No. 21490
7.5/12.5 KV 50 Amp. CAT. No. 21491

The characteristics and construction methods closely follow that of the time proven, well known Hi-Pressure Contact switching equipment. Service records show the inherent quality of the types shown above—and many others to be found in the new bulletin D2. Get your copy today. It is a complete handbook on Distribution Equipment, showing all voltage and ampere ratings up to and including 46,000 volts.

Note the difference and specify accordingly.

RAILWAY AND INDUSTRIAL
ENGINEERING CO. . . GREENSBURG, PA.

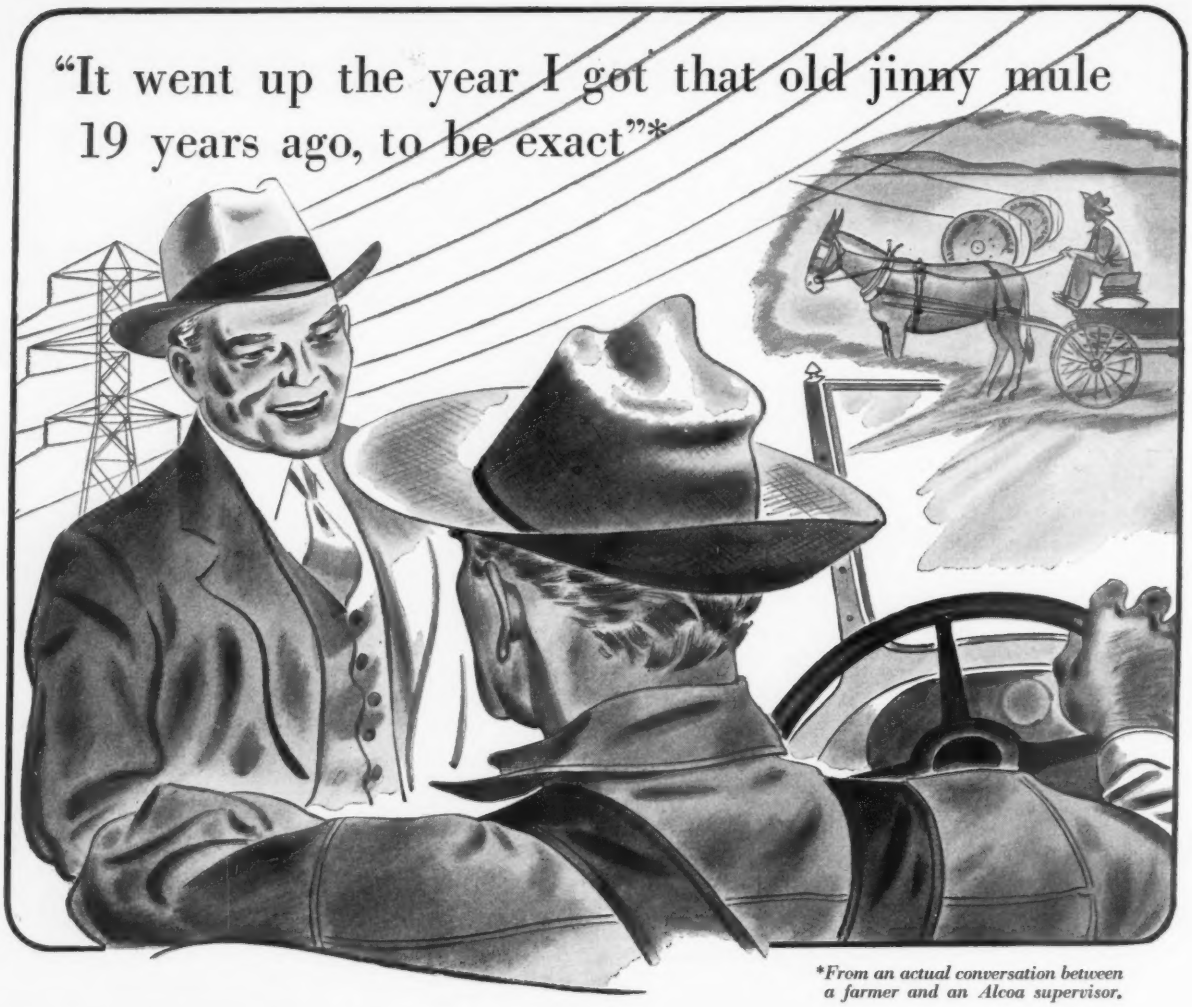
In Canada
EASTERN POWER DEVICES LTD., TORONTO

R&IE DISTRIBUTION EQUIPMENT

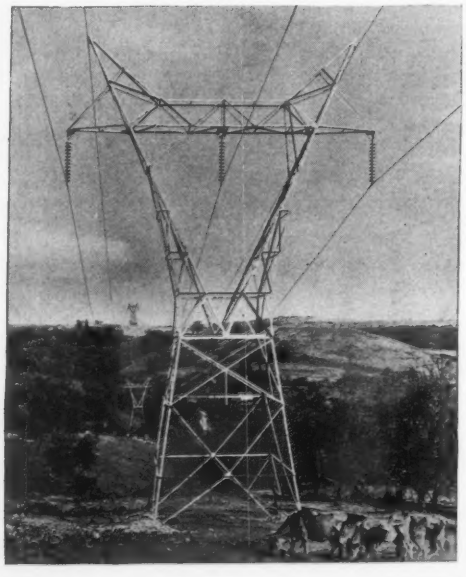
Bulletin **D2**

Get yours and use it!

"It went up the year I got that old jinny mule 19 years ago, to be exact"*



*From an actual conversation between a farmer and an Alcoa supervisor.



"That Aluminum line was built in 1921. I remember—"

Many men, like our rural friend, feel a kinship for the "Aluminum" power lines they've grown up with. They boast how "she rode through the winter of the big blizzard." Or recall seasons of exceptionally high winds, excessive heat and cold. These lines earned this respect by staying on the job, year after year, against serious odds.

Men with the power companies have like respect for A.C.S.R. lines. They know that the ability of these conductors to stay on the job means money in their pockets; maintenance costs are low, emergency calls few and far between. That's why, when they're building a new rural or hi-line, they specify A.C.S.R. Their construction follows A.C.S.R. engineering standards.

ALUMINUM COMPANY OF AMERICA, 2164 Gulf Building, Pittsburgh, Pennsylvania.

A·C·S·R

Aluminum Cable Steel Reinforced

FOR RURAL LINES AND POWER TRANSMISSION

NORGE *Fastemp*

HOME HEATER *for* 1941

gives your salesmen THE MOST SPECTACULAR SALES STORY in the SPACE HEATER FIELD

A TOP-NOTCH SEASONAL PROFIT-BUILDER FOR APPLIANCE STORES is the Norge Fastemp Home Heater line because it brings in traffic and sales when some other appliances are tapering off. A leader in exclusive and dramatic sales features, the Norge Fastemp Heater sales story is spectacular and convincing. Any man or woman can SHOW as well as TELL why this entirely different heater is better and will deliver more heat for less money—will save money because its *all-porcelain* heat distributor will outlast steel, copper alloys, aluminum—is easiest to use because its Single-Dial control gives always-perfect adjustments. Space heaters are a gold mine for many appliance stores. Well over a quarter million will be sold this coming season. Get in on this market with the brilliantly successful Norge Fastemp Home Heater—a proved winner, now soaring to still greater popularity. Send for literature and details about salesroom material that helps everybody sell. Send the coupon.

FEATURES THAT SELL

1. **BEAUTIFUL FURNITURE-STEEL CABINET,** washable wrinkle finish
2. **EXCLUSIVE "L"-SHAPED** heat distributor with 40% more heating surface
3. **PORCELAIN FINISH INSIDE AND OUT** heat distributor; fireproof, moisture-proof, rust-proof
4. **EXCLUSIVE TRIPLE-ACTION SYNCHRO-CONTROL** single-dial adjustment sets air, oil, damper in one motion
5. **EXCLUSIVE DOWN-DRAFT WHIRLATOR** feeds extra air into heart of flame for perfect combustion
6. **LUMINOUS YELLOW FLAME** rich in radiant heat rays
7. **AUTOMATIC CHIMNEY-DRAFT REGULATOR** "balances" draft regardless of weather
8. **ACCESS DOORS** on each end can be opened to emit a flood of valuable radiant heat
9. **VISIBLE OIL GAUGE** on fuel tank shows amount of oil in tank, helps to prevent forgetting to refill
10. **SURE-FLO OIL TANK** with big fill opening and strainer. Tank cap on chain to prevent losing
11. **LOW FLUE CONNECTION** for installation through fireplace opening
12. **CONSTANT-LEVEL OIL METER** maintains uniform fuel flow and heat output
13. **EASY-FILL PORCELAIN HUMIDIFIER,** non-rusting finish for long life and easy cleaning
14. **ELECTRIC BLOWER** (optional) with 300 C.F.M. output sends heat over floor and, if desired, to remote rooms through standard 4" ducts
15. **A GOOD NAME.** The name NORGE is one of the best known and most respected in the home appliance field

NORGE DIVISION BORG-WARNER CORPORATION
DETROIT, MICHIGAN

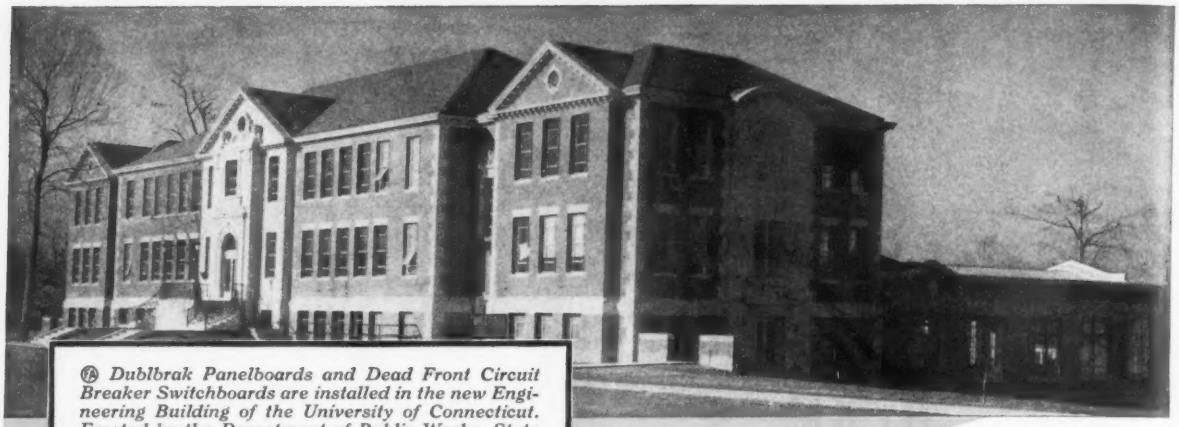
Date_____

Norge Division Borg-Warner Corporation
670 E. Woodbridge St., Detroit, Michigan
Rush me details of your Fastemp Heater proposition.

Name_____
Firm_____
Address_____
City_____ State_____

ES-114

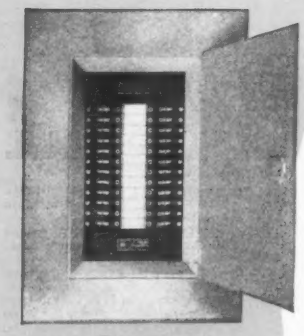
NORGE



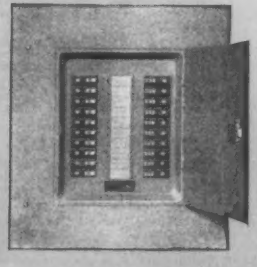
Ⓕ Dublbrak Panelboards and Dead Front Circuit Breaker Switchboards are installed in the new Engineering Building of the University of Connecticut. Erected by the Department of Public Works, State of Connecticut—Robert A. Hurley, Commissioner.

Ⓕ BRANCH CIRCUIT BREAKER CONTROLS REQUIRE 33⅓% LESS SPACE . . .

than is needed for switch and fuse type branches



Ⓕ Type NA1B Dublbrak Circuit Breaker Panelboard, for Alternating Current and Direct Current Service



Ⓕ Type NA1B Circuit Breaker Panelboard, for Alternating Current service only.

THAT means 50 per cent more circuits in the same cabinet space. And the question of space must be considered in new construction as well as modernization. In modernization this is extremely important, because the new thin-wall wiring greatly increases the circuit requirements.

Both the Ⓕ Type AC Circuit Breaker and the Ⓕ Dublbrak Circuit Breaker are but one inch in width. This makes possible the larger number of circuits in the space required for the old-type cabinet, and eliminates the expense of tearing the old box from the wall.

Then, too, due to complete standardization, the units are interchangeable as to capacity. They are manufactured on a quantity basis, and so are priced reasonably. Above all, *they afford modern protection.*

Ⓕ Circuit Breaker Type Standard Panelboards

—like all other Ⓕ Products — are *built better than necessary.* They are designed to be ornamental, as well as practical. Immediate delivery of many styles and capacities may be had from the stocks of wholesalers, and those of our various sales representatives.

Let the Nearest Ⓕ Sales-Engineer Help You

Make it a practice to consult with him. The benefits of his long and specialized experience are yours for the asking. If you do not know where to find him, write us for his name and address . . . and ask for *new* Catalog No. 56 . . . Frank Adam Electric Company, St. Louis, Mo.

EST. 1891 THE SIGN OF A FA BETTER JOB

Frank Adam

STANDARD PANELBOARDS

Circuit Breaker Type

FRANK ADAM ELECTRIC CO.
ST. LOUIS, MO. U.S.A.

The Rewiring Market Is Opening

USE FLAMENOL

Reg. U.S. Pat. Off.

SMALL DIAMETER BUILDING WIRE

(For Rewiring Existing Raceways)

Rewiring jobs used to be hard to get because of the expense involved. But that isn't true any longer. Rewiring with Flamenol Small Diameter Building Wire is inexpensive. New raceways aren't required. Simply replace the wires in existing conduits with more or larger capacity Flamenol Building Wires.

Buildings which need rewiring are everywhere about you—stores, office buildings, apartment houses, factories, schools, hospitals. The wiring in buildings only a few years old isn't adequate to supply modern wattage needs—for today's high intensity lighting—for today's electrical equipment. With Flamenol Building Wire you have a story to tell that should help you to get one rewiring job after another.

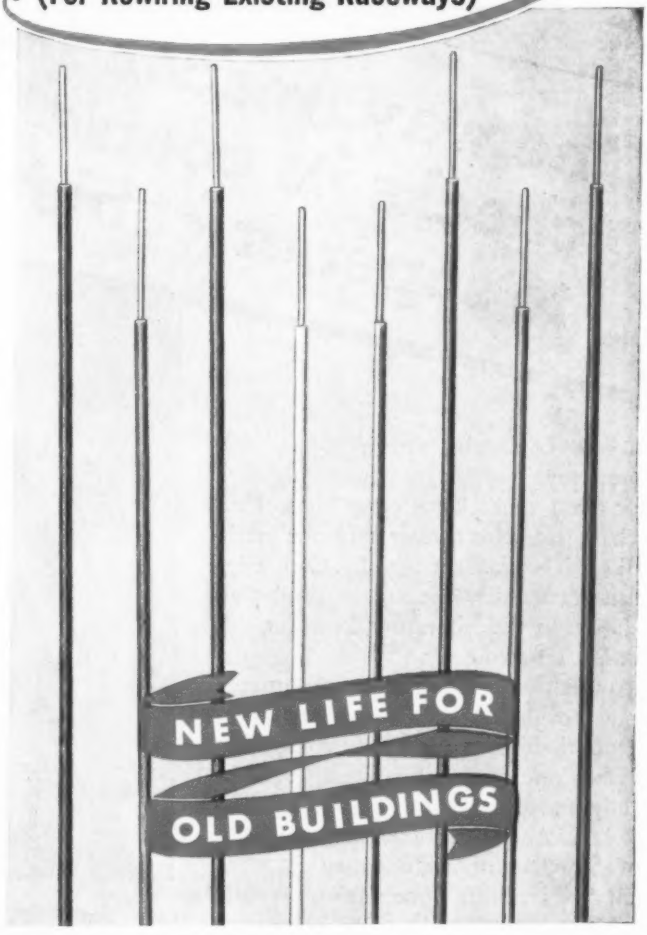
SIZES 14 TO 4/0 AVAILABLE

Whole wiring systems can be modernized with Flamenol Building Wire—feeders, subfeeders, and branch-circuits. It is available in sizes 14 to 4/0 inclusive. Flamenol Building Wire is insulated with a plasticized polyvinyl chloride compound which is a superior material for thin insulation. For instance, it does not oxidize and is practically ageless. It is inherently tough, high in dielectric strength. It resists oil, acids, alkalies, moisture and flame.

EASY TO HANDLE

Moreover, Flamenol Building Wire is easy to install because of its smooth, glossy, wax finish. It is available in a variety of bright colors which make circuit identification easy. Color goes all through the insulation.

For more information about this new wire or for samples see the nearest G-E Merchandise Distributor or mail the coupon below.



Size of Conductors	Number of conductors in conduit or tubing Type R and Type SN																	
	1		2		3		4		5		6		7		8		9	
	R	SN	R	SN	R	SN	R	SN	R	SN	R	SN	R	SN	R	SN	R	SN
14	½	½	½	½	½	½	½	½	¾	½	¾	½	¾	½	1	½	1	½
12	½	½	½	½	½	½	¾	½	¾	½	1	½	1	½	1	½	1¼	¾
10	½	½	¾	½	¾	½	¾	½	1	½	1	½	1¼	¾	1¼	¾	1¼	¾
8	½	½	¾	½	1	½	1	¾	1¼	¾	1¼	¾	1¼	1	1¼	1	1½	1
6	½	½	1	¾	1¼	¾	1¼	1	1½	1	1½	1¼	2	1¼	2	1¼	2	1¼
5	¾	½	1¼	¾	1¼	¾	1¼	1	1½	1¼	2	1¼	2	1¼	2	1¼	2	1½
4	¾	½	1¼	¾	1¼	1	1½	1	2	1¼	2	1¼	2	1¼	2	1½	2½	1½
3	¾	½	1¼	1	1½	1	1½	1¼	2	1¼	2	1½	2	1½	2½	1½	2½	2
2	¾	½	1¼	1	1½	1	1½	1¼	2	1¼	2	1½	2½	1½	2½	2	2½	2
1	¾	¾	1½	1¼	1½	1¼	2	1½	2	1½	2½	2	2½	2	3	2	3	2½
0	1	¾	1½	1¼	2	1¼	2	1½	2½	2	2½	2	3	2	3	2½	3	2½
00	1	¾	2	1¼	2	1½	2½	2	2½	2	3	2	3	2½	3	2½	3½	2½
000	1	¾	2	1½	2	1½	2½	2	3	2	3	2½	3	2½	3½	3	3½	3
0000	1¼	1	2	1½	2½	2	2½	2	3	2¾	3	2½	3½	3	3½	3	4	3

COMPARISON OF WIRE DIMENSIONS				
Size AWG	Approximate Over-all Diameter (In.)		Area in Square Inches	
	Rubber-covered Type R	Flamenol—Type SN	Rubber-covered Type R	Flamenol—Type SN
14 Sol.	.19	.130	.028	.0133
12 Sol.	.21	.147	.035	.0170
10 Sol.	.23	.168	.042	.0220
8 Sol.	.28	.227	.062	.0405
6 Strd.	.41	.314	.13	.0775
4 Strd.	.45	.363	.16	.1035
2 Strd.	.52	.423	.21	.1405
1 Strd.	.59	.496	.27	.1935
1/0 Strd.	.63	.537	.31	.226
2/0 Strd.	.67	.582	.35	.267
3/0 Strd.	.72	.634	.41	.316
4/0 Strd.	.78	.692	.48	.376

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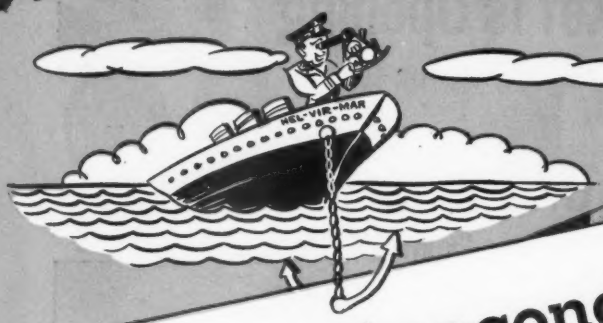

One way Anaconda checks its course to superior cable

THE roles of the ship's navigator and the laboratory engineer are not much different for both must keep close control of their charges or else neither ship nor product will reach its goal successfully. Curiously, the instruments they use are as similar as their duties. In the laboratory, however, the sextant is a refractometer.

Through the use of the refractometer Anaconda engineers keep watch for deviations from their strict quality control system. This is but one of many tests employed in the study and observation of impregnating compounds. And if they can't pass the scrutiny of the refractometer, out they go.

Such painstaking precautions typify Anaconda's methods of bringing its customers wire and cables of unimpeachable quality.

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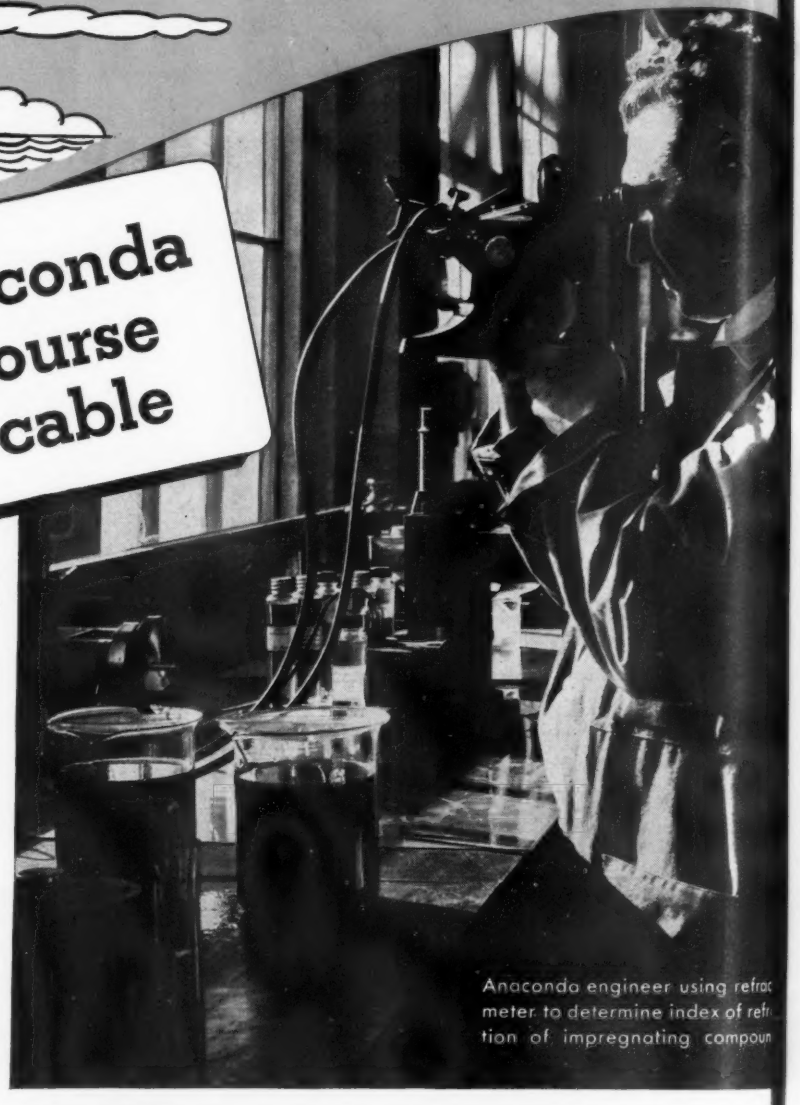
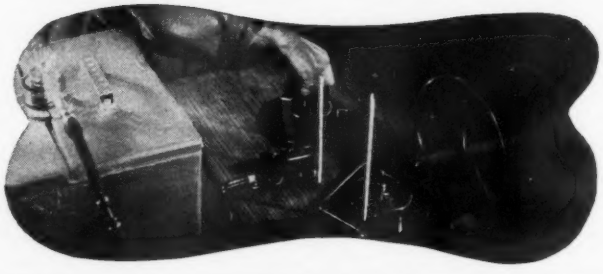


Anaconda engineer using refrac meter to determine index of refr tion of impregnating compoun



Placing oil cell in co stant temperature bat preparatory to maki electrical measureme on impregnating co pounds.

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Subsidiary of Anaconda Copper Mining Company. Sales Offices in Principal Cities

JUNE, 1940

Volume 20 No. 6

ELECTRICAL SOUTH

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Published Monthly by
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PUBLISHING CO.
Marietta and Atlanta, Ga.

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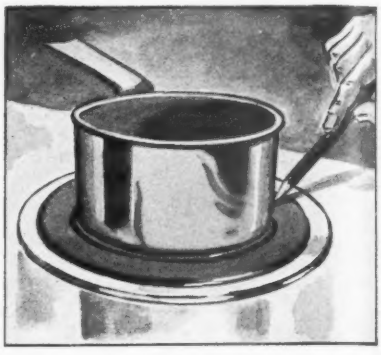
SO I PICKED THE RANGE WIT CHROMALOX UNIT

1. I was out for the best in electric ranges but I hadn't found the one I wanted until . . .

2. I saw one with a range unit that cooks with individual "rings of heat". It was a CHROMALOX unit.



3. This unit has selective cooking areas and I could see how this would save me money whenever I use small utensils.

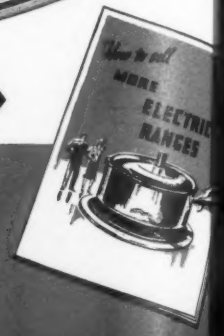
4. Its all-flat top makes cleaning easy—no underneath part requires any cleaning.

5. And, of course, the Chromalox unit has six heats, and gosh, how fast it heats up!

6. So I picked the range with Chromalox units and I've got the best in town.

TAKE a tip from this young lady. Range buyers are looking for the best in ranges — and that includes the cooking unit, too. Be ready for the housewife who asks for the range unit with "selective cooking areas" or other popular Chromalox features. Use Chromalox Units for replacements too — they fit all ranges. Write for this new booklet — **"How to Sell More Electric Ranges"**. It's packed full of sales data and a wealth of material of general interest for every dealer. It's free on request.

Send for it today ➡



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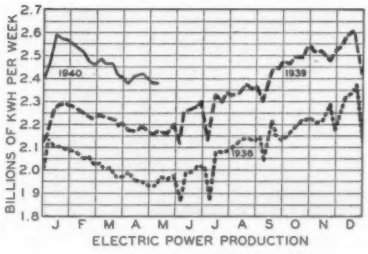
Electrical Business Trends

FIRST-QUARTER figures for the electrical industry all indicate that 1940 may prove to be a record year. New highs for any first quarter since 1937 were established in a number of lines. While it is not anticipated that the trend of sales in the first quarter will be maintained throughout the second, activity in all branches of the industry is holding up well above 1939 and 1938.

Electric power production up to May 25 has averaged well above 10% over 1939. Power production in the southern states in May averaged 12% to 13% over corresponding weeks of 1939, in comparison with increases of only 10% to 11% for the nation as a whole.

Major appliance sales, motor and generator orders, and sales billed on industrial materials, were all substantially higher during the first quarter of 1940 than in the corresponding period of 1939. The increase in industrial materials activity has been particularly great, averaging approximately 35% higher than the first quarter of 1939.



ELECTRIC POWER PRODUCTION

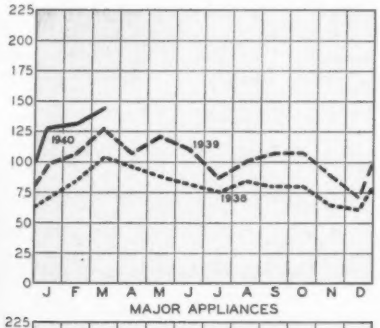
Per Cent Changes 1940 Over 1939	Week Ending May 25	Week Ending May 18
New England	+ 8.1	+ 7.0
Middle Atlantic	+ 7.3	+ 7.2
Central Industrial	+14.5	+16.2
West Central	+ 6.2	+ 6.9
Southery States	+12.2	+13.3
Rocky Mountain	+13.5	+13.7
Pacific Coast	+ 8.4	+ 5.8
Total	+11.1	+11.6

Electrical wholesalers' sales during the first quarter of 1940 continued well above figures for the corresponding period of 1939 but by March the gain had dropped to only 15% compared to approximately 25% increases recorded in January and February. In the southern states, electrical wholesalers' sales for March 1940 were above March 1939 by 13%, 9.9% and 11.1%, respectively, in the South Atlantic, East South Central and West South Central states.

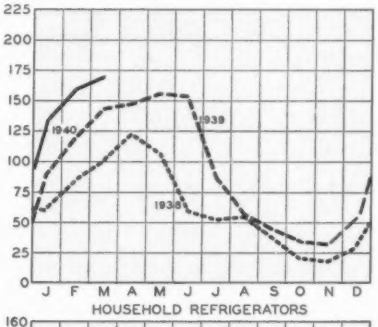
Improved consumer purchasing power in the southern states was reflected in increases in appliances well above national averages. Range sales in the 16 southern states for the first quarter were 28,368 as compared with 20,261 for same period of 1939, an increase of 40%. Range sales in country as a whole totaled 117,282 during first quarter, an increase of only 27% over same period of 1939.

Further improvement is also to be noted in sales of washers and ironers in southern states in comparison with national sales. For the first quarter of 1940, national washer sales totaled 411,276, an increase of 4.8% over sales in same period of 1939. Sales in 16 southern states in first quarter totaled approximately 70,250 representing an increase of 13.5% over sales in same period of 1939. Similarly,

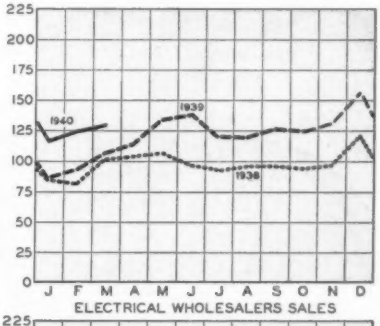
(*Continued on page* 62)



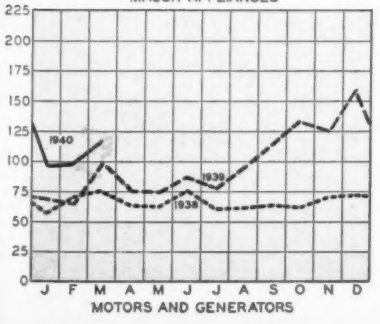
MAJOR APPLIANCES



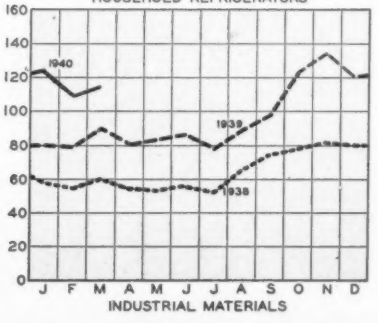
HOUSEHOLD REFRIGERATORS



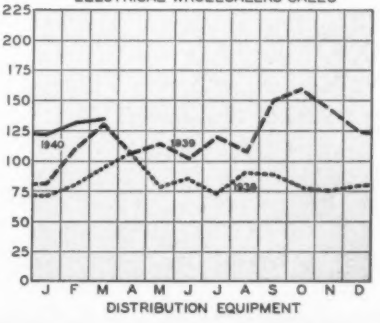
ELECTRICAL WHOLESALERS SALES



MOTORS AND GENERATORS



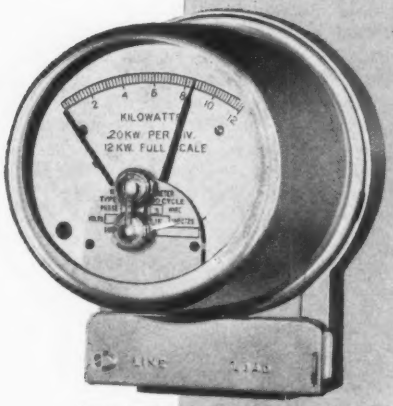
INDUSTRIAL MATERIALS



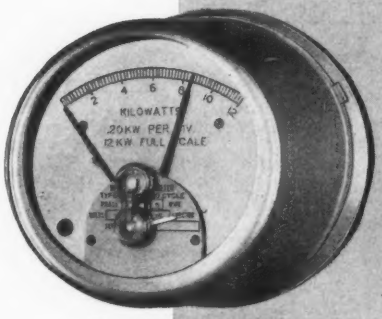
DISTRIBUTION EQUIPMENT

All of the above indexes of electrical business activity are based on figures available from the National Electrical Manufacturers Association, except the index of electrical wholesalers' sales which is based on data published by the United States Department of Commerce. The indexes on motors and generators and distribution equipment are based on orders received, while the index on industrial materials, including such items as electrical porcelain, mica, vulcanized fiber and laminated products, is based on sales billed. The index on distribution equipment includes such items as high voltage insulators, paper cable, power switching equipment, power distribution transformers, and varnished cambric cable. The index on major appliances does not include refrigeration. The index on household refrigerators includes complete household refrigerators, separate household evaporators, and separate systems of 1/4 horsepower or less. The index on electric power production is based on data released by Edison Electric Institute. 1936 averages taken as 100%.

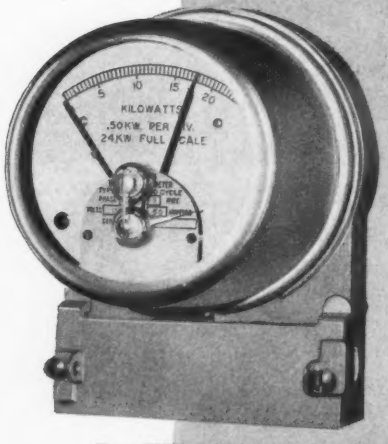
MAINTENANCE IS MINIMIZED WITH Lincoln MAXIMUM DEMAND METERS



Type WDA Singlephase and Two-Element, 3 Wire

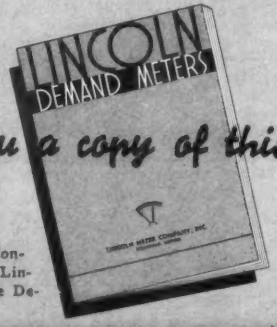


Type WDS Singlephase and Polyphase



Type WDP Polyphase

WITH Lincoln Maximum Demand Meters, the effort and cost of demand meter maintenance is at an absolute minimum. This is primarily due to the thermal principle by which these meters operate. Since these meters are merely deflection type instruments, but highly time-lagged, and because there are no timing mechanisms involving motors, springs, or gears, there is practically nothing to wear—assuring sustained accuracy and long, trouble-free life. Operating independently of the watt-hour meter, and available in a complete line of indicating and graphic instruments, Lincoln Meters are easily adaptable to any demand application where accurate, maintenance-free measurement is required.



Have You a copy of this Bulletin ?

It describes the design, construction and operation of Lincoln Watt Demand, Ampere Demand, and Graphic Demand Meters, complete with instructions and price list. . . .

LINCOLN METER DIVISION
SANGAMO ELECTRIC COMPANY SPRINGFIELD ILLINOIS

Organizing Local Promotion of the
Building Rewiring Market

Suggested procedure for electrical league or utility to initiate a local rewiring program

By E. A. Brand
Buffalo Niagara and Eastern Power Corp., Buffalo, N. Y. Member, N. F. P. A. Electrical Committee; and Chairman, E. E. I. Wiring Committee.

LEADERS of electrical trade paper advertising in recent months have undoubtedly seen such catchlines as "New Small Diameter Building Wire Opens Tremendous Market," "Here's How to Get Gold Out of the Commercial Rewiring Market," "For Rewiring Existing Raceways," etc. Apparently some people believe there is a new market to be tapped, and that the tools to do it are at hand. They are right, there is a new market and it contains gold for utilities, manufacturers, wholesalers, contractors, and labor—if aggressively promoted.

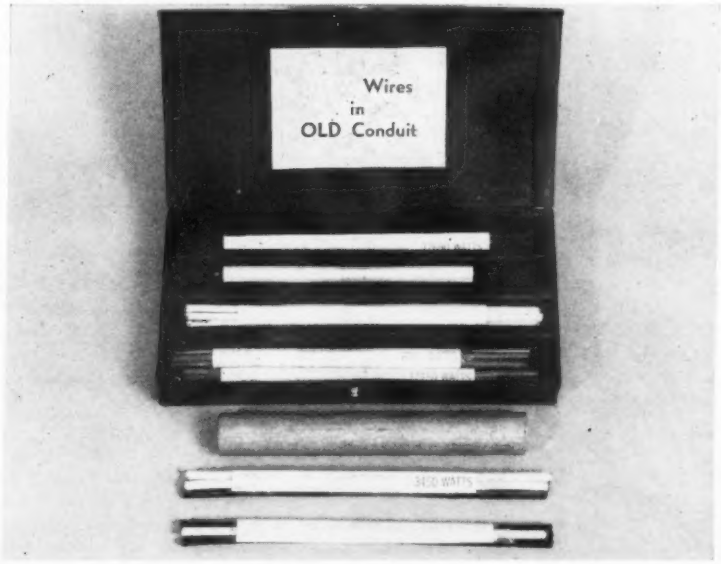
The market consists of electrical modernization including rewiring of our present inadequately wired and lighted commercial and industrial buildings. The tools are the new small diameter or thin-wall insulated building wires to be recognized by the 1940 National Electrical Code, together with the increased fill of conduits to be permitted for rewiring. The spark-plug is provided by local promotion.

It should hardly be necessary to stress the practically untouched market thus opened to the electrical industry. The need to relight is obvious. This means not only stores and office buildings, but schools, apartment houses, libraries, factories—the entire group of structures where fire-proof construction with concealed conduit systems has made increased wiring capacity difficult and expensive in the past. Specialized fields are those of window relighting, promotion of room coolers, of commercial cooking, ventilation equipment, etc.

All of these activities are hampered to a greater or lesser extent by insufficient copper and by the cost of changing existing facilities with conventional methods, a cost which looms disproportionately high in the mind of the customer. Particularly is this true of wiring for lighting, since here the circuits are usually concealed and at the same time are most widespread.

Conduits and wire still are buried in concrete slabs, but copper capacities can now be doubled, tripled and still further increased merely by pulling out the existing conductors and installing new larger small-diameter wires. These new conductors have been described in detail to readers of ELECTRICAL SOUTH, so that a technical description should not be necessary. Table I graphically illustrates the increased branch circuit capacity possible. It compares the number of conductors of sizes 14 to 8 that can be installed in ½ inch and ¾ inch conduit when using conventional conductors for new work and thin-wall insulated conductors for rewiring. In the latter case the new Code will permit a 50 per cent fill rather than the usual 40 per cent fill.

If only a replacement of existing branch circuits were involved



A graphic demonstration for building owners and operators, school superintendents, or any rewiring prospect is possible with this kit which includes groups of conductors bound into convenient bundles and circuit arrangement with watts capacity plainly indicated.

(as it frequently is), it would mean substantial business to the trade. Actually, in many cases, new panelboards, feeders, services and transformers may be necessary to keep pace with increased circuit capacity, so that volume per job becomes very attractive. Since usually an increase in wiring is interesting to a customer only because he contemplates additional electrical load, the effect on utility load-building is obvious.

Under the circumstances it is apropos to consider ways and means of approaching this market so as to obtain a reasonable share of potential business.

First Steps

It is first necessary to recognize that certain preliminary steps usually must be taken locally before active promotion with customers can begin. The 1940 National Electrical Code does not officially become effective until late this year. Hence, theoretically, the new conductors and the increased conduit fills cannot yet be used. In most cases, however, municipal and insurance company inspection authorities are quite willing to grant permission for employment of new Code rulings prior to the effective date, if a demand exists. Hence, the first step is to discuss the matter with the inspection authorities and secure their permission to use the new wiring materials.

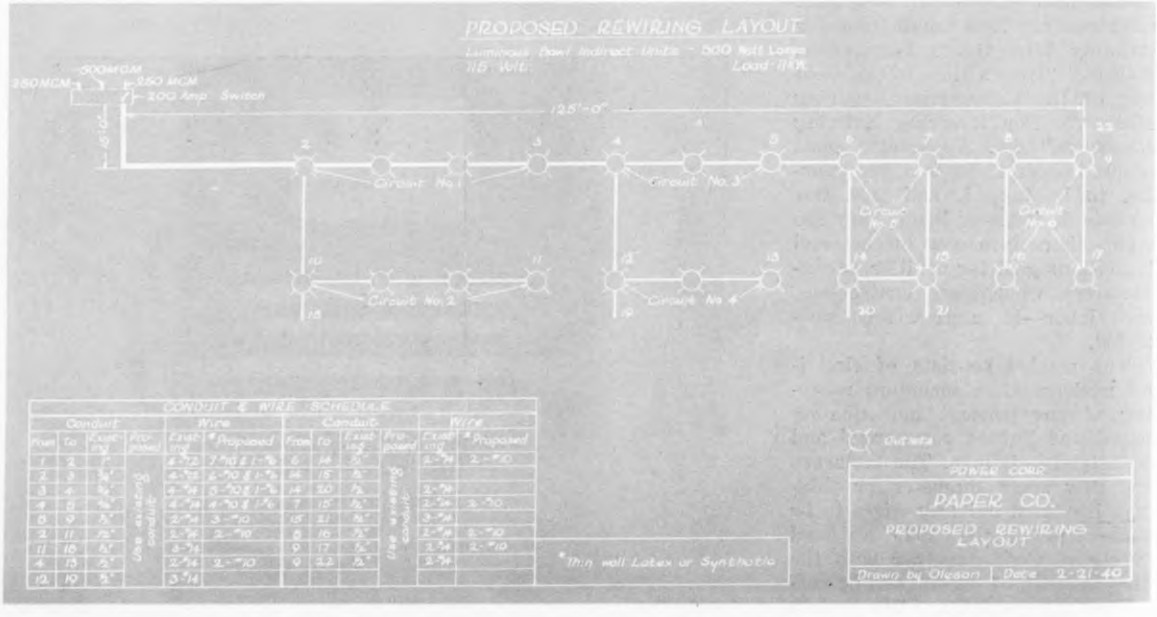
Occasionally wiring ordinances are so worded that new editions of the Code do not automatically go

Table I

Comparison of Number of Conductors of Various Types of Insulation Permitted in ½-inch and ¾-inch Conduit

No. Conductors—	1	2	3	4	5	6	7	8	9
Conductor Size	**For New Construction or Rewiring—Type R, Code wire; Type RP, Performance; Type RH, Heat-Resisting**								
14	½	½	½	½	¾	¾	¾		
12	½	½	½	¾	¾				
10	½	¾	¾	¾					
8	½	¾							
	For Rewiring,—Type RPT*, Performance Thinwall; Type RHT, Heat-Resisting Thinwall								
14	½	½	½	½	½	½	½	¾	¾
12	½	½	½	½	½	¾	¾	¾	¾
10	½	½	½	½	¾	¾	¾	¾	
8	½	½	¾	¾					
	For Rewiring—Type RU*, Latex Thinwall; Type SN, Synthetic Thinwall								
14	½	½	½	½	½	½	½	½	½
12	½	½	½	½	½	½	½	½	¾
10	½	½	½	½	½	½	¾	¾	¾
8	½	½	½	¾	¾	¾			

*These insulations are not recognized in size No. 8.



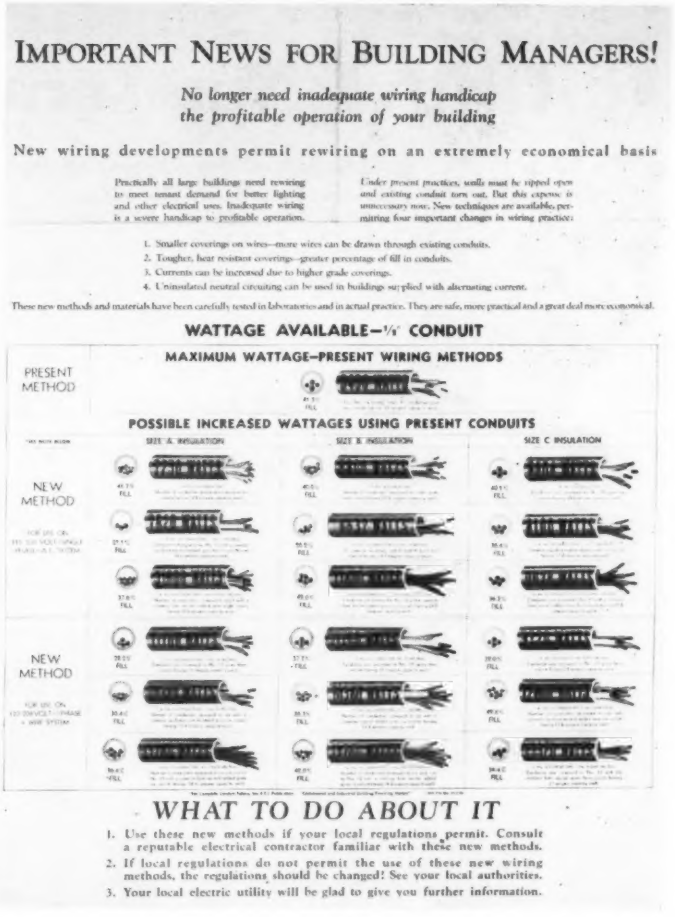
A complete wiring layout for every prospective job is most desirable since it provides all contractors bidding on an installation with detailed knowledge of sizes and types of conductors, changes in panelboards, etc. It also provides the successful bidder with a working plan to follow in making the installation. A typical layout plan used successfully in one city is shown here. It includes all data in compact form, and is easy to follow.

into effect and no one may be authorized to grant permission for installations other than those covered by the specific Code on which the ordinance is based. In these cases it will be necessary to secure a change in the local ordinance.

Strong Promotion Necessary

Next, use of the small diameter conductors and of the increased conduit fills must be aggressively promoted, even though these are of assistance to building owners and managers in maintaining the integrity of their investments by keeping the building modern electrically. The public will not rush out to buy. Everyone drives an automobile and perennially is in the market for a new one. The automobile dealer, however, does not sit in the showroom waiting for the public to seek him out. He goes after the prospect to trade in the old car, tactfully pointing out the features of the 1940 models to make the owner thoroughly dissatisfied with his present vehicle. Similarly, when a car is taken in to be serviced, the service foreman sorrowfully discovers that it needs a new ring job, the tires are smooth, and the paint looks doubtful. So he tactfully suggests this would be a good time to trade it in on one of the new super supers.

The electrical industry can well adopt similar aggressive tactics. Electrical modernization also must be sold. Since wiring is merely a means to an end it must be sold by making the customer dissatisfied with his present use of electricity—whether this be an insufficient level of lighting, insufficient number of outlets or switches, excessive and costly voltage drop, the lack of ventilation or air conditioning, or whatever it may be.


IMPORTANT NEWS FOR BUILDING MANAGERS!
No longer need inadequate wiring handicap the profitable operation of your building
New wiring developments permit rewiring on an extremely economical basis
Practically all large buildings need rewiring to meet tenant demand for better lighting and other electrical uses. Inadequate wiring is a severe handicap to profitable operation.
Under present practices, walls must be ripped open and existing conduit torn out. But this expense is unnecessary now. New techniques are available, permitting four important changes in wiring practice:
1. Smaller coverings on wires—more wires can be drawn through existing conduits.
2. Tougher, heat resistant coverings—greater percentage of fill in conduits.
3. Currents can be increased due to higher grade coverings.
4. Uninsulated neutral circuiting can be used in buildings supplied with alternating current.
These new methods and materials have been carefully tested in laboratories and in actual practice. They are safe, more practical and a great deal more economical.
WATTAGE AVAILABLE—¾" CONDUIT
MAXIMUM WATTAGE—PRESENT WIRING METHODS
PRESENT METHOD
POSSIBLE INCREASED WATTAGES USING PRESENT CONDUITS
SIZE A INSULATION
SIZE B INSULATION
SIZE C INSULATION
NEW METHOD
NEW METHOD
WHAT TO DO ABOUT IT
1. Use these new methods if your local regulations permit. Consult a reputable electrical contractor familiar with these new methods.
2. If local regulations do not permit the use of these new wiring methods, the regulations should be changed! See your local authorities.
3. Your local electric utility will be glad to give you further information.

This broadside available from the Edison Electric Institute can be used advantageously in local promotions. It points out the tremendous increase in capacities now possible in existing conduits, stressing the fact that most of the original investment in the wiring installation is still useful and can be salvaged.

Specific Suggestions

In some areas promotion will be carried on through the utilities, In others, it will be handled through electrical leagues, electrical associations or other industry groups. The suggestions following are adaptable to either method with minor variations in the nature of publicity and of personal handling. In either case, local leadership is required under the auspices of one organization or group.

The following steps have been found useful in opening this market in a given area.

(1) Some one person in the utility company or in the electrical association should definitely be charged with the job of wiring promotion. He might be called a technical advisor. If with the utility, he should be a member of the sales department. He should be a capable man, preferably with some engineering training; have the ability of tactfully presenting new and different ideas; be a good speaker and a salesman not readily discouraged when the going is tough. It will be his responsibility to carry on the necessary technical and policy discussions with local inspection agencies and trade groups; to become thoroughly familiar with the established procedure regarding wiring practice; to acquaint and assist the electrical trade in wiring promotion methods; to supervise or advise in the preparation of plans and specifications involved in wiring promotion.

In other words, some one person should become the sparkplug of the activity insofar as each area is concerned.

(2) Check the local situation to determine whether permission must be secured from regulatory bodies to employ the new materials and methods. In some areas it may not be necessary. This is purely a local problem and must be dealt with as such. Since the new Code will be effective about November 1940, in any case, few authorities will stand in the way of a legitimate business stimulant such as this.

(3) When the way has been cleared to proceed, the next step is to make certain that the trade is well informed. In this connection it should not be overlooked that the use of thin-walls and of increased conduit fills will open

(Continued on page 66)

Selling Industrial Lighting

Lighting sales offer opportunities for industrial plant electrification to aggressive power salesmen

By Roy A. Palmer*

Illuminating Engineer, Duke Power Co., Charlotte, N. C.

FOR over twenty years there has been conducted an aggressive educational campaign directed to industrial executives outlining the advantages of better lighting. In the early days of this campaign, there was not much factual proof to substantiate statements which appeared in trade journals, articles, advertisements, sales promotional literature and other media. Illuminating engineers and others close to the lighting business were convinced beyond question that the statements they made regarding increased production, lower labor turnover, fewer accidents, less spoilage and other benefits of better lighting were founded on a sound basis. However, the industrial executive had to accept these claims on the basis of faith because of the lack of supporting evidence.

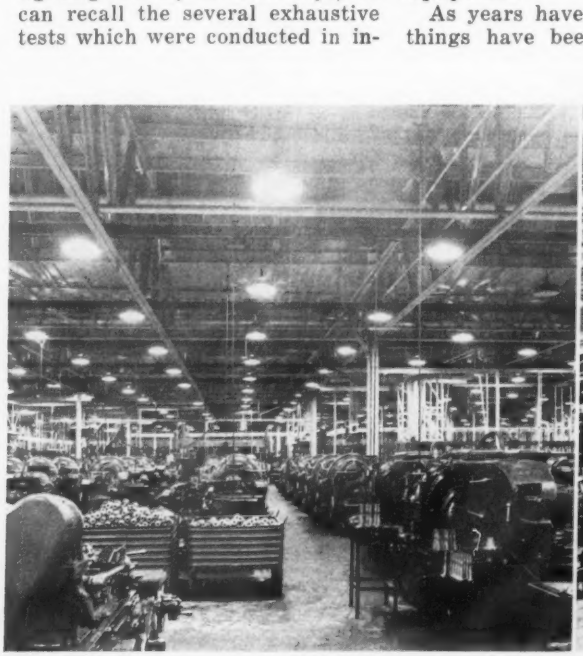
As we look back to industrial lighting activity in those days, we can recall the several exhaustive tests which were conducted in industrial plants by various unbiased organizations to prove that better lighting would increase production. Close track was kept of production under existing lighting and with all the variables eliminated as far as possible, compared with production when improved lighting was provided for the same work. These tests substantiated to a large extent these claims.

However, even in the face of these valuable data, industrial lighting progressed at a relatively slow pace. We needed something more in the way of sales ammunition and data with which to convince the industrial executive that better lighting in his plant would be a part of his production tools the same as modern machines and equipment.

As years have gone on, several things have been brought about which have contirbuted enormously towards a greater acceptance of the benefits which better lighting will bring. Several years ago, the Science of Seeing was brought out of the laboratory with indisputable and convincing data showing that the process of seeing was dependent upon several factors, among which the quantity and quality of lighting were extremely important.

The advent of the light meter gave us an instrument by which the layman could himself measure the illumination at any point. This meter provided the link which was heretofore missing in the lighting story. The fact that the human eye is in itself a poor judge of the amount of light present made it extremely difficult, even with all the facts available to convince an industrial executive or anybody else that the illumination was insufficient. The light meter per-

* Abstracted from an address before the National Power Sales Conference, Hotel Roanoke, Roanoke, Va., April 25, 1940.



The examples of modern industrial lighting application on this and the following page are exceptions because the majority of industrial plants are still far underlighted according to present day standards. To the industrial power salesmen, these installations are of particular interest because the sale of better lighting is almost invariably followed by the sale of additional wiring and further applications of power and heat. The installation of 400 watt Type H (Mercury) lamps in this metal parts plant permitted a more efficient use of floor space. The hosiery mill, at right, is provided with more than 40 f.c. by 85 watt, Type RF (Fluorescent) lamps.

All photos used in this article are reproduced through the courtesy of the General Electric Company.

haps was one of the most valuable contributions toward enabling us to tie in effectively the Science of Seeing story and thereby convince the customer that better lighting was absolutely necessary to supplant the existing inadequate installation.

The Better Light-Better Sight movement was the logical outgrowth of the enormously valuable information which the Science of Seeing had made available. Even in the midst of the business depression the lighting business went forward. More lighting equipment was sold, more lamp bulbs manufactured and more kilowatt hours consumed, all because consumer acceptance had been built up for better lighting. The Better Light-Better Sight program interpreted the Science of Seeing laboratory data in laymen's terms. The light meter permitted the customer to see for himself the condition of illumination in his plant, store, office or home.

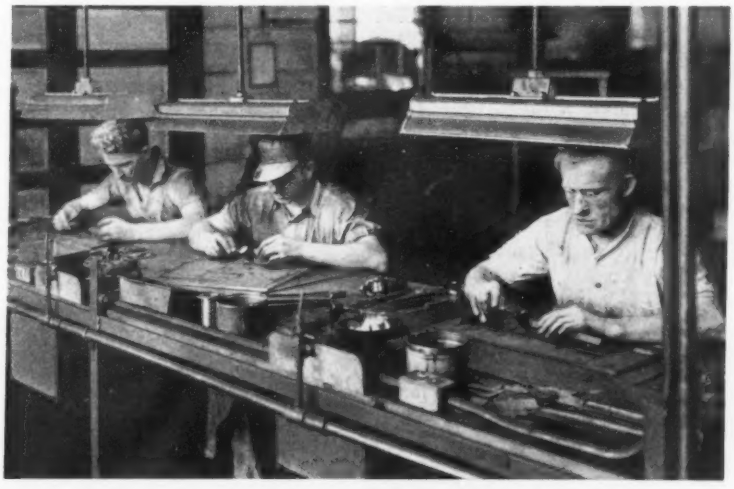
We must not fail to give credit to the I.E.S. lamp in this program of education because by its adoption in millions of homes, school dormitories and other places, people generally became acquainted with the delightful comfort which quality foot-candles could provide. It is a matter of record that industrial executives after having read their newspaper under the illumination from an I.E.S. lamp, were sold on the idea that better lighting could be used to advantage in their plant.

Another contributory factor in this growth of acceptance for lighting standards on the part of the public is the constantly lower rates for kilowatt hours. Because electricity costs less today, people are more willing to install more wattage and use lighting for longer hours. Unfortunately we still have a big selling job to do in convincing the public further that electricity is cheaper today than it ever has been in history. We still must continue to emphasize this fact at every opportunity. We should constantly be using every promotional resource possible to remind the public that electricity is the lowest priced commodity on the market today.

More recently the introduction of the fluorescent lamp with its several advantages that have un-

A continuous trough of fluorescent daylight lamps above this conveyor solves a problem of lighting for fruit inspection in this packing plant. High footcandles and color quality are required here.

Table lamps here provide 250 f.c. for extremely fine detail work. A general level of illumination of 40 f.c. is provided by continuous rows of RLM fluorescent luminaires.



Lamps are now available having low radiant heat which permits the use of 100 f.c. or more for bench work such as shown here without causing discomfort to the worker from the heat of the lamp.

usual appeal to the consumer are further contributing towards the acceptance of higher lighting standards. Perhaps the greatest interest that this lamp has aroused on the part of the public is the greater output for the wattage consumed. I am not sure but that this is another indication of our failure to sell the public on the idea that electricity is the lowest cost item in general use today. We have had a marvelous story to tell about lower cost of electricity but still salesmen had to wait for a new lamp to appear upon the market before they progressively and enthusiastically talked about lower lighting costs. The success of this new lamp, however, is opening up a new cycle in lighting practice and acceptance. At the present time it does not fit every lighting job and, therefore, should be specified only with knowledge and good judgment.

Better Public Acceptance

As a result of all these developments over the past several years, we now have an interest aroused in better light on the part of everyone. When we have store owners, office managers, home owners and others interested in lighting this naturally contributes to a greater interest in the minds of industrial executives. We can say with assurance that today, as perhaps at no other time, we have a greater acceptance of better lighting. Is it not logical then that we should use industrial lighting sales as an entering wedge in the industrial plant to assist in complete electrification of that plant?

A discussion of lighting with the industrial executive will provide an entree to plants where before it has perhaps been difficult to get in. Moreover, when better lighting has been sold, there invariably has been built up a feeling of good will. In all of my experience I have never found a lighting salesman who was accused by a customer for having oversold or high-pressured him into something that was not useful and beneficial. A salesman might have used some high pressure to sell the job, but because the place was so much more cheerful, the workers so pleased and other benefits so obvious that the investment, however large or small, was considered a practical and wise move.

A good many splendid lighting jobs have been sold in this country over the past several years. Those are the jobs we hear about and see written up in the trade journals, but, by and large, they are the exception. The majority of industrial plants are still far underlighted according to present-day standards. A trip through most any plant at random with a light meter will reveal that enormous improvement can be made. In fact, the lighting art is advancing so rapidly that even in the plants which we consider well lighted today, there are many opportunities for still greater improvement.

In our company, we have constantly pointed out to our lighting salesmen that as soon as a customer has been sold better lighting he is immediately a prospect for more lighting. There is always some place, even in the well-lighted plant, where additional footcandles and improved quality of illumination can be used.

We have the past experience, laboratory data and vast store houses of information which show us that there is a need for improved lighting. Present day living and working conditions impose a high tax upon the visual sense. Even where a worker is tending to an automatic machine, good illumination is necessary. It is often the opinion of the industrial executive that because a worker does not require to use his eyes constantly while working on an automatic machine, there is no need for a high level of illumination. However, when that machine does need attention that worker must be able to see quickly, distinctly and safely. The worker's eyes control not only the work done by him but the judgment of speed of machines, color of materials and quality of goods. It perhaps is quite unnecessary to mention here that the proficiency of a worker depends largely upon seeing conditions. Anyone informed on some of the fundamentals of the Science of Seeing can immediately appreciate the value of good seeing to any work.

In addition, we must not overlook the psychological aspects. Today's industrial executive is much more concerned about the employees' working conditions. He is interested in having his plant free from accidents and the general working conditions such that the employee is contented and happy. Good lighting contributes in every way. It guards against accidents because the speed with which a worker can see may prevent an accident. The atmosphere of the room will contribute to the employee's mental attitude. There is a plant in North Carolina which had an enormous labor turnover in the night shift. When that work room was relighted, that labor turnover dwindled to a negligible percentage.

New Wiring for New Lighting

In the very great majority of cases when new lighting is sold, a new wiring job is necessary. Very often this means re-arranging and installing new switchboards as well as new circuits, switches, etc. This in turn may involve circuits to motors and heating devices in the plant. The alert power salesman having an eye to such changes which may be necessary, then has an opportunity to suggest additional motors and heating equipment.

One can make a pretty safe bet that the existing wiring in a plant is loaded up to capacity. When new wiring is being installed for lighting, additional wiring can also be installed to take care of heating equipment which at the present time may be too small for the job to be done, but which perhaps has not been changed merely because the existing wiring cannot take it. If we install wiring on the basis of voltage drop rather than ampere carrying capacity we will not only provide for immediate use, but also provide for reasonable future requirements and at the same time assure the consumer of maximum efficiency of the equipment.

In many plants, particularly the older ones, machines have been placed along the windows of the room to take advantage of daylight. There are thousands of plants today where the daylight conditions are not satisfactory and very often the placing of machines along windows handicaps the routine of the production line. With good artificial illumination, it is not necessary to locate the machines with respect to the availability of daylight. Therefore, the installation of lighting may permit the re-location of the machines throughout the room. When such a change is made, obviously there are plenty of opportunities to suggest the elimination of line belts and the installation of individually motorized machines.

While the power salesman is talking lighting to the industrial prospect, he is in effect a lighting and seeing specialist. If he does a good job by showing that he has a good knowledge of his subject,

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Concentrate on a Single Line

Advises J. H. Eberhardt, successful New Orleans appliance sales manager

CONCENTRATING all of a dealer's energy, advertising and cumulative resources on a single line of merchandise over a period of years is bound to build increasing business in that line in the opinion of John H. Eberhardt, electrical appliances department manager for the Maison Blanche department store in New Orleans.

No will o' the wisp lure of higher percentages or novelty gadgets has been able to convince Eberhardt that he should make a change from the refrigeration line he began with nine years ago and his success would indicate that his theory is more than sound.

He led all refrigeration retail sales in the New Orleans area in 1939 and believes he is at or near the top for the entire South. He is not content to rest there, however, but is pushing on to higher levels for the current year and believes he will reach them despite unsettled conditions in price competition early this year.

Some of Eberhardt's policies may appear unconventional to more conservative dealers for he has tossed more than one established practice into the ash can. He has blazed new merchandising trails in some particulars and some of these have won national recognition.

Eberhardt believes in giving live wire salesmen live wood to work with and quite often pulls a surprise that might lead some to question his policies. These things, however, have shown his salesmen, most of whom have been with him for his entire nine years with his present line, that they can rely on his judgment.

If he sees lists of prospects kept by individual salesmen are not producing results, he throws the whole prospect file out of the window and starts over again. His advertising, sales approach and handling of traded-in merchandise also depart from what many consider the accepted practice.

Eberhardt's department sold 750 boxes in 1939. These were not generally lowest priced of the line, but averaged $196 per unit sold. This tops his nearest competitor by a good margin for the New Orleans area. He is continuing this policy in 1940. Despite rather drastic reductions for all refrigeration lines, he is maintaining an average price of $179 per unit this year.

Eberhardt is a convert to the theory that advertising should be done in a big way or not at all. His splash, full page ads make full use of white space, large type, attractive illustrations and convey his message in few words, all told in large, readable type.

His advertising in daily newspapers totaled 53,000 lines last year, most of it in the form of full page displays. He is following the same policy this year and one ad published January 11 has won national recognition for its composition.

In addition he contracts for two or three radio announcements daily during the busiest part of the refrigeration selling season.

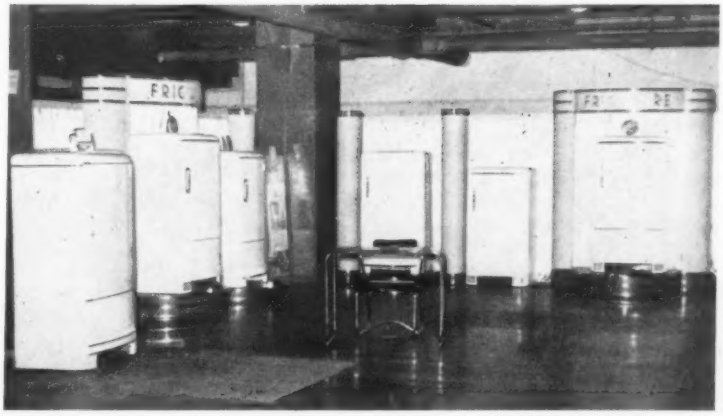
Eberhardt's six salesmen and his assistant manager maintain their own prospect files. Three remain on the floor while the others call on specific prospects. No time is wasted on haphazard, chance calls or canvassing. The salesmen alternate three days on the floor and three days in calling on prospects.

These salesmen, all of whom have been with the department from three to nine years, operate on commission ranging from 5 to 10 per cent and proof that each did his share of selling is indicated by the fact that all paid income taxes last year.

Eberhardt does not attempt to recondition boxes traded in on re-

(*Continued on page 24*)

J. H. Eberhardt, progressive manager of Maison Blanche electrical appliance department.



A corner of the 10,000 square feet which Maison Blanche department store, of New Orleans, devotes to electrical home appliances. Fifty refrigerator models are maintained on display, representing at least one of every model and combination carried. Six refrigerator salesmen divide their time on the salesfloor and outside.

Temporary lighting service provided by La Vigne Electric company of Miami has proven to be a first class business builder besides being profitable in itself. Shown here is temporary installation made for Biltmore Horse Show, at Tropical Park, Coral Gables.

Exhibition Lighting "Pays Off" Twice

AN EXHIBITION lighting service which, besides being profitable in itself, has proven to be a first class business-builder for other departments, is operated by George La Vigne, electrical contractor of Miami, Fla.

In addition to the financial benefits directly traceable to this service, "La Vigne Electric," the trade style under which Mr. La Vigne operates, credits the plan with an advertising value dificult to reckon in dollars and cents.

"Practically every city and town throughout the South," says H. W. Ferguson, La Vigne Electric's superintendent, "has one or more advantages worth publicizing. Therefore, it does, or should, highlight them whenever possible by carnivals, pageants or any other method at its disposal. And there is a growing trend toward night events.

"That means an opportunity in every community for some enterprising electrical contractor to develop a profitable sideline by furnishing the necessary illuminating equipment, its installation, maintenance and its removal after the affair is over."

Civic promotions, including those sponsored by municipal governments, Chamber of Commerce, the "service clubs," such as Rotary and Kiwanis, cover only a limited portion of the potential field open to this phase of the electrical contracting business. Events of this kind include special athletic exhibitions, fairs, fruit and produce festivals and anniversary celebrations.

A third section of the field —and probably the most lucrative from a profit standpoint—may be termed "commercial" demand for special, temporary lighting. The boundaries here are dictated only by the amount of business activity in the locality involved and the enterprise of the electrical contractor, who furnishes the service. To mention but a few of the "hot prospects" in this class: formal openings of stores and restaurants, sporting events and industrial and merchandising exhibits. Individual exhibitors frequently want their concessions "spotlighted" which, of course, is an extra service outside of the regular contract and is charged for as such.

In fact, any kind of exhibition, which requires, or can benefit by, mass publicity offers first class possibilities. And these are not limited to open air and tent exhibits poorly lighted buildings, where such events are held, present much the same requirements for extra illumination.

Selling angles, such as the advertising value of brilliant lighting and the reduction of accident hazards, are immediately apparent.

The type and quantity of equipment necessary to provide special illuminating service naturally depend on the potential demand existing in the locality to be served. The apparatus required runs the entire gamut from arcs and generators for floodlighting a "garden fete" at a Palm Beach estate to the modest needs of a small tent show or a lawn party. Material (exclusive of lamps) which the contractor has in stock will represent about 15% to 25% of the total investment.

La Vigne Electric, which has demonstrated its ability to handle practically any job that comes its way, has an investment of $3,000 to $4,000. In the area it serves, civic and commercial activity runs high and has become increasingly less seasonal.

Among the lighting contracts La Vigne recently has handled are a water pageant, requiring the illumination of a ship channel, and a motor boat show. For the latter, held in a tent, 45 reflectors of various types were used. About 40% of these were designed for 1,000-watt lamps and the others ranged downward from 500 to 150 watts, lighting an area of 15,000 square feet.

As La Vigne operates this type of business, the annual return on the investment can run as high as 50%. Mr. Ferguson, however, stresses the point that large-scale, temporary lighting service is profitable only when it can be conducted on a limited competition basis.

In towns and smaller cities, lighting service operations managed on a much less pretentious scale offer wide possibilities as profit-builders. Obtainable in outdoor or indoor types, equipment for small exhibits or social affairs, which can be handled with lamps not exceeding 150 watts, is readily available at a very moderate cost.

The direct net returns from the sale of this service represent only a fraction of the advantages it has to offer. It leads logically to another lucrative field: store display and showroom lighting contracts. Merchants, who plan new display facilities or the modernization of old ones, may know little or nothing about correct display lighting.

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Swing Out for Summer Sales

A snappy, golf tournament contest designed to achieve a balanced movement of several different appliance lines

ONE OF THE minor difficulties which has been encountered in competition-against-quota contests, particularly in the electrical appliance field, is the fact that the contest essentially is an incentive toward dollar volume increase, generally taking no account of what particular merchandise contributes to the volume. Ordinarily, this makes very little difference, since the demands of an equable market will coincide with a well balanced stock.

Frequently, however, it is desirable to place emphasis on the sale of certain particular items, as well as on dollar volume. This need is particularly felt in the spring and summer, when appliance lines are changing, new lines being introduced, and efforts at closing out old lines being made. A typical contest of this sort which can be aimed directly at achieving a balanced movement in all lines of goods is the "Golf Tournament" contest. It is also a good vehicle for use in any sales organization during the summer, since summer contests should normally be short, peppy and interesting, to offset the shortness of the season.

The Golf Tournament can be renamed any way desirable to the individual operator. The Jones Appliance Company might run it as "The Jones Country Club Championship Tournament." Again, it might be called "The British Open Tournament," or any pretentious and professional-sounding title.

In narrowing a contest down to apply to a balanced movement in different lines of merchandise, both the inventory of the merchandise and its dollar value must be taken into consideration by the operator. In general, the appliance picture will be about like this: the dealer has his new line of refrigerators, which was announced early in the year, but will also have some stock of the previous year's model left on hand. While he naturally wants to get the new line moving, he also wants to clean out the old line, to put his capital back into use. Since they've been carried over a year's inventory, he's probably charged off a

bit of depreciation on them, and is probably listing them somewhat lower than the new line, either with or without the manufacturer's help in absorbing part of the reduction.

Obviously, the dollar volume incentive to the commission salesman is to push the new line, which is listed higher: what the dealer wants to do is to push *both* lines, letting the buyer find his own level between the price differentials. The same will apply to radios, with a slight difference. The dealer has his previous year's model, announced the previous fall, and will have a new line announced at the end of the summer. Naturally he wants to clean out the old line as completely as possible before the new line is announced. And so on through his stock of home laundry equipment, fans, sweepers, and minor appliances.

It then behooves the dealer to establish contest values which represent, not only so many sales in dollars, but also sales in specific products, and to keep the two from conflicting. This is accomplished in the Golf Tournament as follows.

The merchandise should first be classified into four groups, roughly like this: refrigerators (values from $125 to $195), washers (values from $39.50 to $89.50), radios, (values from $15 to $75), and minor appliances (values from $5 to $20). These brackets are approximate, and can be adjusted to fit the dealer's own price range and inventory. The idea is to set up four brackets so that one sale out of each will represent a decent week's sales for a salesman: the average refrigerator sale will run about $150, the average washer about $50, the average radio about $30, and the average minor appliance about $10. This will give a total in the neighborhood of $250, which would represent a fair week's volume for one salesman, and, on a 10% commission, a fair remuneration for him. The various lines of merchandise carried, such as ironers, fans, sweepers, irons, etc., can be classified in the bracket to which they best fit.

These brackets are then renamed, being called, for contest purposes, the drive, the mid-iron shot, the approach, and the putt. A bulletin should be posted, classifying every item carried under one of these four headings, so that the salesmen know which golf shot is represented by each piece of merchandise.

The tournament is then set up on a six weeks' or two months' basis, which is called a "six-hole golf course," or nine holes, if the contest is to be run nine weeks. Ordinarily, six weeks is a more satisfactory run.

Four shots are necessary to complete each hole: the drive, mid-iron shot, approach, and the putt. This means that in order to complete each hole, the salesman must make a sale each week from each division of merchandise. The obvious effect is to place new and old merchandise on the same level for contest purposes, offering an

incentive to move the old lines, and also to keep salesmen from ignoring the lower priced items, such as radios and minor appliances, in favor of higher priced items. Naturally the dealer wants dollar volume too, but it is plain that if the force puts forth a balanced effort at the entire stock, dollar volume will inevitably result.

Scoring the Sales

Thus, if a man sells a refrigerator and a washer the first week, he has completed his drive and mid-iron shot, but still needs an approach and a putt to finish the hole. He may go on into the second week, and get a drive or a mid-iron shot there too, but he still has to complete the first hole's approach and putt before he is considered to have finished the hole, and be in line for the tournament championship.

Sales in the "approach" and "putt" brackets can be credited back to whatever holes need them, no matter in what week they are made. The only question which needs settling by the individual operator is whether or not major shots, such as drives and mid-irons, can be "carried over," that is, if a man sells two refrigerators in one week, whether the second sale can be credited as his "drive" for the next week. This can be settled by the dealer and his staff; usually, it has been found best to allow the carry-over on drives and mid-irons, but not on approaches and putts.

The scoreboard and score-keeping is simple: the scoreboard needs only a large piece of beaverboard listing each man's name at the side, with about six inches' space between each name. The numbers 1, 2, 3, 4, 5 and 6 can then be listed under each other beside each man's name, and his progress on each hole traced on the corresponding line. When he makes his "drive," or refrigerator sale, a curved line on the proper level is drawn approximately two thirds of the way across the board. His "mid-iron" will bring him about half the remaining distance. His "approach" will put him almost at the end, or "on the green," and his "putt" completes the hole.

If the board can be decorated at the top with a few cartoons of golfers, so much the better, and it is a good idea to draw a circle at the end of the line representing each hole, to simulate the "green," with a dot in the middle representing the "cup." Thus the requirements accomplished by each man are graphed on the scoreboard at the end of each week; if he still lacks a putt on the first hole, the scoreboard shows it. When he later makes a sale in the "putt" bracket, it is marked on the board and he is said to have finally "holed out on the first."

In allocating the prizes and determining the winners, the value of dollar volume should not be ignored, though primarily the purpose of the contest is a pattern of sales corresponding to the needs of the inventory. Thus, the man who has actually completed the full course, holing out on every hole, is the champion. If more than one man achieves this, then naturally the one with the greatest dollar volume is the champ, and the others are "runners up." The accomplishment of contest requirements is kept on the scoreboard, and the dollar-volume record is maintained on the contest record form which has been described in a previous article in this series, so both data are at the dealer's fingertips.

There should be, then, a grand prize for the tournament winner, a flexible number of worthwhile prizes for the runners-up, those who completed the six holes, and also a "consolation" prize for any man who went over his dollar-volume quota for the contest period, even though not completing the actual "controlled sales" requirements of the contest itself. This latter prize should be in ratio to the amount the man went over his dollar quota (the quota being the amount of sales necessary to satisfactorily support his salary or drawing account on a 10% basis), and usually a cash bonus in the form of an extra 5% on sales over the quota total is the best consolation prize.

This contest is flexible, interesting and flashy, having all the requisites to keep the men's interest up, and is simple and inexpensive to stage. It offers plenty of possibility for loquacious house-organ chatter: the house-organ can be called "The Sporting News," or the "Tournament Weekly," and plenty of slang can be injected, applying golf terms to selling.

Concentrate on One Merchandise Line

(Continued from page 21)

frigerators sold. This reconditioning, which is done only with better class merchandise traded, is contracted for satisfactorily and sold at a separate salesroom in an annex operated by the Maison Blanche store. Average cost of trading is less than $1, Eberhardt said. Two salesmen are employed selling the traded in merchandise. Boxes traded in and not considered worth reconditioning are sold as they are.

The appliance department on the fifth floor of the Maison Blanche store occupies 10,000 square feet of floor space and displays 50 refrigerators. At least one unit of every size and style in the line is displayed in the general space, or in model kitchens arranged for such purposes.

Eberhardt believes most of his sales are traceable directly to advertising and resales to customers who had purchased earlier models. He says that this is possible, however, only by thorough salesmanship and followup of inquiries.

"We overlook no bets and while each salesman uses his own prospect list these are not relied on entirely," Eberhardt said. "If we find that we are not getting results from a prospect list, I throw it out and start over again. They've got to be live prospects or there is no use carrying them along.

"Along with our advertising, I believe our sales record also is largely attributable to the fact that all our salesmen know the line we are handling. We have concentrated all of our interest in knowing all about this line and providing adequate service and satisfaction to customers at all times.

"This has resulted in cumulative sales over a spread of years that materially boosts our volume."

While the efforts of Eberhardt's department is concentrated on refrigerator sales, the department handles radios and washing machines. In contrast to the six employed in refrigerator sales, one salesman each is assigned to radio and washing machine sales.

Summing up his sales record, Eberhardt says he believes that knowing all the answers to all questions which prospects may raise, is a major factor in his business. National advertising and other factors in connection with the line he handles all favor him, Eberhardt says, but he believes that "hitting the ball" with sales appeals and followup are the final argument in sales production.

Active Defense of Rights Urged on Utility Managers

SPEAKERS addressing more than three hundred utility executives at the seventh annual conference of the Southeastern Electric Exchange, in Roanoke, Virginia, May 9-11, suggested more active participation in politics, greater interest in selecting representatives, and circumvention of unjust treatment by carrying their case direct to the people.

REVIEWING the many attacks directed at the utilities during the past several years, and discussing the current problems that confront this industry, Charles E. Ide opened the seventh annual conference of the Southeastern Electric Exchange. His address, as president of the group which includes thirty operating companies in ten states, followed an address of welcome by Clem D. Johnson, vice president of the U. S. Chamber of Commerce, and a response by A. W. Higgins, president, Florida Power Corporation.

Increased cost of operations have resulted from the new burdens that have been placed on the industry, Mr. Ide declared, and the continued spread of government subsidized competition is making the position of the private utility increasingly difficult. Mr. Ide directed attention particularly to the many types of service which private companies render along with the kilowatt-hours they sell. He raised the question as to whether private companies can continue to supply these supplemental services if they are forced to compete on a rate schedule with subsidized municipal systems which do not perform these services for customers.

Industry in the Southeast

"The Industrial Tomorrow in the Southeast," was the subject of an address presented at the opening session of the conference by E. W. Palmer, president, Kingsport Press, Inc., Kingsport, Tennessee. Tracing the rapid industrial development of the Southeast in the last few years, Mr. Palmer also cited some of the factors that have placed this section at a disadvantage such as the inequality of freight rates. The effect of cosstantly increasing tax burdens on the development of the South was especially emphasized by Mr. Palmer.

"Business men are prone to deal with fundamentals; to evaluate trends in the light of past accomplishment tempered with a knowledge of existing conditions and their natural effect upon capital, the consuming public, the employed and government. No matter from what angle we attempt to view the present economic situation, it presents a serious situation that demands a serious approach, if a solution of some of our national ills is to be discovered," Mr. Palmer said.

"There's something in dealing with our daily problems besides the immediate effect upon our respective pocket-books; there is a far more serious future ahead of American business should it fail to read the handwriting upon the wall of human progress, and having read the warning, fail to exert every available means at its command to stem the evident trend away from the fundamental principles of business and government that have made this the greatest nation on God's footstool."

Thomas W. Ozlin, commissioner of the State Corporation Commission of Virginia, next addressed the conference, his subject being "Trends in Regulation." The development and procedures that

Representative Bruce Barton of New York, was principal speaker at the annual banquet of the Exchange. He outlined a two-point program for the preservation of democracy: (1) a strong national defense, and (2) the creation of a spirit of devotion and consecration to America such as the "fire" of national pride which dictators have "somehow" been able to instill in the people of totalitarian states. At the speakers' table are Charles E. Ide, president of the Exchange, Rep. Barton, Mrs. Ide, and Bryan Hanks, of Florida Power and Light Company.

have occurred in Virginia in the way of speeding up the matter of rate regulation was discussed at some length. In discussing the trend of regulation nationally, Mr. Ozlin said:

"We are all too aware of the trend of recent years in regulating, not only your business, but our whole economic system, by taxation (not for revenue, but for regulation), by intimidation, and by government subsidy and government competition. While all business has undoubtedly suffered from this policy, perhaps yours has suffered most of all. During this period, a fourteen billion dollar industry has been under the lash, and has almost stood still, when it should have gone forward as few others have done . . .

Industry Sadly Dragooned

"Can there be any doubt that the vitality and confidence of American industry has been sadly drained by the dragooning and badgering it has received? No greater proof is needed than our continuing relief rolls, and ten million idle men, although billions of dollars have been poured out in a ceaseless torrent, to prime the pump . . . Industry is denounced for its failure to recover. Capital is charged with being 'on a strike.' We may assume that those who have shaped the course of things have always been actuated by the very best intentions, yet it is an undeniable fact that industry is being criticized for being unable to do what it is actually being prevented from doing."

"Taxation" was the scheduled subject of an address by C. W. Kellogg, president of the Edison Electric Institute, but because this subject had been covered so thoroughly by Mr. Palmer, Mr. Kellogg left his paper for inclusion in the transcription of the conference and spoke informally on some of the problems facing the industry and the country. Of these, he said that the preservation of individuality is the most important problem facing the country. The increasing tax burden, he pointed out, is one of the important problems facing the utility industry.

Taxes Exceed Dividends

"Last year for the first time in history," he said, "the tax payments of the private electric light and power industry exceeded the entire dividends paid on preferred and common stocks, the taxes being about $350,000,000 and dividends on all classes of stock about $25,000,000 less. The tax payments were $70,000,000 in excess of the interest and amortization on all bonds outstanding." He explained that any such relationship between payments of taxes and payments to owners on their investments would be discouraging enough for any ordinary industry but it becomes especially so to the utilities who have plant investments of approximately $6 per dollar of gross annual earnings in comparison with most manufacturers who have only an average of 75c invested in plant per dollar of gross annual earnings.

The first session of the conference was concluded with a report by R. I. Butterworth, chairman of the Engineering and Operations Section, on activities of the past year.

Well attended Thursday evening was the session featuring a lecture and demonstration on lighting presented by H. Freeman Barnes, sales promotion manager, General Electric Incandescent Lamp Department, and a moving picture, "The Middleton Family at the World's Fair," presented by Westinghouse Electric and Mfg. Co.

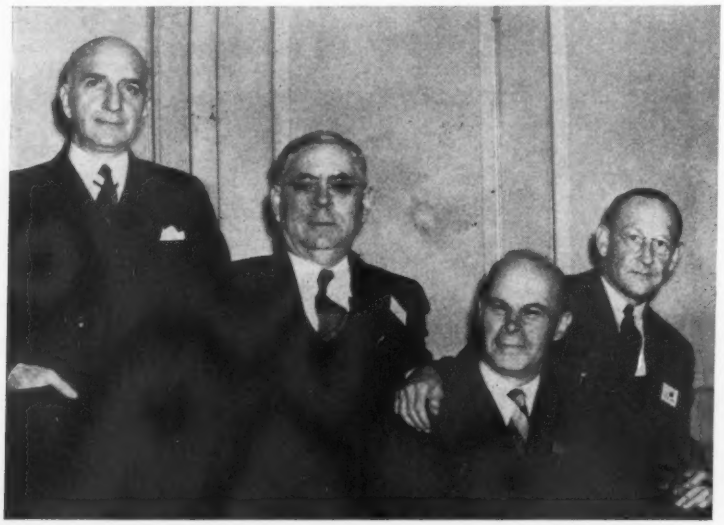
The Friday morning session opened with a report on the work of the Employee Activities Committee presented by W. A. Moore, chairman. He was followed on the program by Elmo Roper, distribution consultant, of New York City, who discussed, "What the Customer Thinks of Utilities." Mr. Roper drew upon a number of surveys which had been made for various utility companies to present a general analysis as to what the average citizen thinks about various phases of utility operation and other current problems.

What the Customer Thinks

Nearly one half of the persons approached in a recent survey favored government regulation of utility rates, the public opinion expert told the conference, but over two-fifths were opposed to electric power production by the government. Mr. Roper was not able to divulge the exact area covered by his surveys.

The public likes labor, Mr. Roper declared, and doesn't think labor gets paid enough. It thinks labor should have the right to unionize, and that any employer who fights the principles of unionization is stupid. But it also thinks unions should be incorporated and should be legally responsible for their acts just as any other corporation.

Largely through some recent unwise leadership, Mr. Roper said, the public believes that labor has finally caught up with capital as to the extent of its misdeeds and is today equally responsible with capital for such misunderstandings and disputes as now arise. In short, the public now holds that unions need a housecleaning from within and government regulation from without.



Among those who addressed the Exchange conference were, left to right, E. W. Palmer, president, Kingsport Press, Inc., Kingsport, Tenn.; Thomas W. Ozlin, State Corporation Commission, Richmond; and C. W. Kellogg, president, Edison Electric Institute, New York. C. A. Collier, vice president, Georgia Power Co., at right, is a director of the Exchange.

Further discussion of labor and unionization were contributed to the conference by H. W. Story, vice president and general counsel, Allis-Chalmers Manufacturing Co., Milwaukeee, who spoke on "The Closed Shop Issue."

Mr. Story expressed his irritation at the arbitrariness of the National Labor Relations Board's action in disenfranchising employes by refusing to permit them to vote for so-called company unions. "My irritation is not due to the untimely fate of the company unions involved," he said, "but, instead, to the violation of the principle of civil liberty in permitting the Labor Board to substitute its discretion for the will of the employees as expressed through a secret ballot. Freedom of choice was and is a mockery under such a system."

The progress of events during the past 20 years were analyzed by Mr. Story as a background against which to discuss what he termed the major issue which confronts industrial management, "the closed shop." Although originally instituted by American labor as protection against the onslaught of cheap alien labor due to the operation of a questionable immigration policy, the two main reasons labor leaders seek the closed shop today are (1) the effective collection of dues, and (2) the maintenance of discipline within the labor organization.

Secret Closed Shop Assailed

Mr. Story bitterly denounced the "secret closed shop" which he termed an insidious practice that had recently crept into the industrial relations of this country. Under this plan, which usually comes about as a matter of expediency based upon a defeatist attitude of the employer and a very persuasive line of argument of the labor leader, the union does not insist upon the inclusion in its formal contract of a closed shop provision. Instead, the union, will accept a gentleman's agreement to permit the union to use strong arm tactics against employees to force them to join the union and, after they have joined, to stay in line with union policies.

"I have no respect for an employer," Mr. Story said, "who, through cheating expediency, sells his employees down the river of strong arm unionism and at the same time undermines the morale of his management group and the discipline of his shop." In conclusion, he offered, as a complete answer to the closed shop issue, a long-range program based on "fairness and firmness."

Charles Ide, retiring president of the Exchange, congratulates Albert W. Higgins, president of Florida Power Corporation, St. Petersburg, who succeeded him at the close of the convention.

Philip Sporn, vice president and chief engineer, American Gas and Electric Service Corp., New York, brought the Friday morning session to a close with an address answering the question, "What is an Integrated Electric Utility System?"

Citing the complex nature of the problem and the many phases of electric utility system development and operation that need to be considered to determine whether a system is an integrated public utility system, he confined his discussion to the historical development of a system, the feasibility of operating it economically as a single inter-connected and coordinated system, and the effect of the "state of the art" on the size of the system that can be integrated.

Discussing the experience of the American Gas and Electric Company, Mr. Sporn pointed out how the present Central system of that Company, starting with a nucleus in 1907 which comprised four communities in Indiana, Ohio, and West Virginia with a total peak load at that time of 4,610 kw, has developed by a process of integration of existing facilities and by expansion of new facilities into communities that never had electric service before into a power system that now serves over 1400 communities with an average population of 1900, with over 648,000 consumers, with a 1939 peak demand of 909,000 kw and 1939 system input of close to 4,760,000,000 kwh.

This system has at the present time, he said, a capacity of over 190,000 kw of hydro capacity, over 980,000 kw of steam generating capacity, and has under construction some additional 201,500 kw of steam capacity of which some 86,500 kw will go into service in 1940 and the balance in 1941. The high tension network consists of 1390 miles of 132,000 volt transmission, most of which is double circuit so that there are some 2359 circuit miles of 132,000 volt line linking and tying together every important load center of the system.

Advantages of Interconnection

By a series of historical maps, Mr. Sporn traced the development of facilities on a system basis and on a basis to make available to every community on the system the advavntage of integrated system development and operation. As a consequence, he said, all communities on the system are not only able to have ample supplies of power but are able to get the advantages of highly economical energy sources and the advantages of utmost reliability in service supply that can come only from

Higgins Heads Exchange

A review of the career of Albert W. Higgins, newly elected president of the Southeastern Electric Exchange, reveals a period of nearly thirty years devoted to the utility business and at least an equal number of years of progressive activity in civic and trade associations.

Born in Boston, Massachusetts in May, 1880, Mr. Higgins attended grammar and high schools at Newton, Massachusetts. This was followed by four years at Massachusetts Institute of Technology from which he graduated in 1901 with a degree in chemical engineering.

Upon leaving M. I. T., his first position was with the Sayles Bleacheries, Saylesville, Rhode Island. Other engineering positions followed until 1912 when he became associated with the American Public Utilities Company at Grand Rapids, Michigan and, from this time on, his business activities have been centered around utility operations and executive management of operating properties.

For several years, he was president of the Virginia Public Service Company, with headquarters at Charlottesville, and the Seaboard Public Service Company, at Alexandria.

Since 1936, Mr. Higgins has served as president of the Florida Power Corporation, serving Florida's West Coast, with headquarters at St. Petersburg, and the Florida Public Service Company, serving central Florida. He is also vice president of the Georgia Power and Light Company, serving the southern part of Georgia.

a large well interconnected system.

Reports from the Accounting Section and Sales Section were presented at the concluding session of the conference Saturday morning. Herman W. Boozer, chairman of the accounting group, outlined the work of the section during the past year. He directed the attention of chief executives to the varied duties of a controller as defined by the Controllers Institute of America and suggested that consideration be given as to whether each company is making full use of its chief accounting officer.

R. B. Roberts, chairman of the Sales Section, urged that companies be equipped with an ample force of all-service salesmen, trained and directed to do the selective job that develops plus dollars of net revenue in every classification. He suggested that the removal of the barrier of traditional methods of measuring sales results seems to be the first step in more closely coordinating utility sales efforts with the most important utility sales objective, i.e., increasing plus dollars of net revenue.

Included on the program of this last session were two addresses presented by women employees of operating companies: "Customer Research Pays" was the subject of a paper by Mrs. Genevieve McCrary, Customer Research Department, Florida Power Corporation; while Miss Naomi Shank, director home service, Virginia Electric and Power Co., talked on "Home Service Activities of Today."

The concluding address on the conference program was "There is Work to be Done" presented by C. E. Swartzbaugh, president of Swartzbaugh Manufacturing Company, and president of the National Electrical Manufacturers' Association.

"There is a job ahead for business, industry and private enterprise," Mr. Swartzbaugh said, "of a type with which it is not too familiar. There is work to be done which will tax the ability and ingenuity of all of us who believe in private free enterprise.

"For today, in this country, we have this peculiar anomaly existing: The products of industry rank high in public esteem—but the enterprise which invented, developed, designed and created them are damned—and that, despite a record of achievement which is unparalleled in history . . .

"We need now to remind ourselves," Mr. Swartzbaugh continued, "that our industrial institutions are greater than their products—to remind ourselves that if the public holds the product in high esteem, it is our fault if the institution that produced it is damned."

Discussing the new frontiers that remain to be developed by the electrical industry, Mr. Swartzbaugh declared that if the present almost startling results of the National Adequate Wiring Program continue, we're liable to find our present manufacturing, distribution and installation facilities inadequate. The national potential of business it may conceivably produce is almost astronomical.

These cooperatively developed and conducted promotional pro-

New officers elected at the closing session of the conference, in addition to President A. W. Higgins, were, left to right, first vice president, L. P. Sweatt, Mississippi Power Co., Gulfport; second vice president, C. C. Curtis, Savannah Electric and Power Co.; and third vice president, Rex I. Brown, Mississippi Power and Light Co., Jackson. New members of the board of directors include: W. O. Turner, president, Louisiana Power and Light Co., Algiers; A. B. Paterson, president, New Orleans Public Service, Inc.; and McGregor Smith, president, Florida Power and Light Co.

grams open new sales horizons for the electrical industry—they help educate the public to the nicety, cleanliness, efficiency and economy of complete electric service—they create new jobs—they have been a factor of plus business in the industry—and are in the public interest, for they have educated the public to a higher standard of living.

Mr. Swartzbaugh suggested, in conclusion, that a joint industry program to promote commercial and industrial electrical modernization might well be our next all-industry activity—certainly there is need for such modernization—it is a large and desirable market—and it is a great industry opportunity.

Excerpts from some of the addresses presented at the conference follow. These include interesting paragraphs but are not presented as complete summaries of the talks.

TAXATION

By C. W. Kellogg

President, Edison Electric Institute, New York

Adapted from an address presented at the seventh annual conference of the Southeastern Electric Exchange, in Roanoke, Virginia, May 9-11, 1940.

LAST year for the first time in history the tax payments of the private electric light and power industry exceeded the entire dividends paid on preferred and common stocks, the taxes being about $350,000,000 and dividends on all classes of stock about $25,000,000 less. The tax payments were $70,000,000 in excess of the interest and amortization on all bonds outstanding. For any ordinary industry such a relationship between payments to government and payments to owners would be discouraging enough, but it becomes especially so with an industry like the utilities where the investment is so outstandingly large.

To make this point clear I have only to remind you that while the average manufacturing industry has but 75 cents invested in plant per dollar of annual gross earnings, our electric utility industry has about $6.00 per dollar of gross earnings, or about eight times as much as the average manufacturer. So when taxes exceed dividends or interest charges with our industry, it is a condition of serious import to the investing and consuming public.

The purpose of taxes is to pay for government and the function of government is to do for the people in a cooperative way those things that they cannot as effectively or efficiently do for themselves. When the cost of this service rises to the height shown by the figures I have quoted, as to the ratio of the tax burden to investment return in an industry which is so preponderantly of an investment nature as the utilities, the question insistently rises as to whether our economic system can long stand the strain.

How the Burden Has Grown

One of the most disturbing angles of the tax burden is the speed with which it has grown. In the first century of our national history taxes were a mere incident in the business life of the average citizen. At the turn of the century all taxes amounted to about 8 per cent of the national income and the total public debt, Federal, State and local, was but 3 per cent of the national wealth. The requirements of the World War increased total taxes to over 10 per cent of the national income and raised total public debt to over 11 per cent of the national wealth. The war being then viewed as a catastrophe not likely to recur, the people shouldered the huge burden and went to work valiantly to pay off the huge debt. By 1929, ten years after the war, the total public debt was 9½ per cent of national wealth but taxes had grown to 12.3 per cent of national income. Since then the tide has turned; taxes have grown to 21 per cent (and government expenditures to 28 per cent) of the national income, and total public debt now stands at 18 per cent of national wealth—a ratio six times as large as in 1902.

History records that the downfall of the Roman Empire and the French Revolution were both largely due to the effect of excessive tax burdens imposed by a despotic central government. These led first to the ruin of private households, then to the ruin of public finances, and finally, to complete break up of the government.

The Effect on Business

With us in the present state of affairs, the result of heavy taxation is to destroy stockholders' equities, constituting a levy on capital. The low interest rates now prevailing are not a healthy sign; they merely reflect the small demand for capital, arising from the fact that the size of the tax burden deters people from putting out capital into the expansion of industry or the formation of new enterprises. Our national growth for over a century was built up by such investment in productive enterprises. To the extent that such prosperity was financed by

Left to right, J. G. Holtzclaw, president, Virginia Electric and Power Co., Richmond; John Talley, executive secretary, Southeastern Electric Exchange, Atlanta; M. J. O'Connell, president, Virginia Public Service Co., Alexandria; Paul Vecker, vice president, Carolina Power and Light Co., Raleigh; and Charles E. Ide, president of the Exchange, East Tennessee Light and Power Co., Bristol.

venture capital, the increased future productivity of the country helped to wipe out previously created debt.

Taxation is largely responsible for the reversal of this trend, and during the last decade, instead of building up capital, the United States has witnessed one of the most gigantic dissipations of capital in history. The National Industrial Conference Board reports that "American business drew on its capital in 1938 for the 9th consecutive year. These nine drafts on capital total 41.4 billion dollars, a loss which has nearly wiped out the 45.9 billion set aside as business savings between 1916 and 1929." (N.I.C.B. Economic Record, March 22, 1940, p. 104).

In the electric utility industry during the last decade net available for return on investment has declined by $49,000,000, although fixed capital has increased by $1,700,000,000. The margin by which the earnings failed to show an equal return on the increased investment is approximately equal to the increase in taxes during the period. That the utilities have striven manfully to overcome other economic handicaps is strikingly shown by an increase for the decade in *operating* net earnings (exclusive of taxes) of $123,000,000 in the face of 16 per cent decrease in gross earnings per kilowatt hour and 36 per cent growth in wages per man hour.

What's to be Done About It?

On account of the huge scope of our governmental activities nowadays any discussion of this great and overwhelming problem of the tax burden tends to be barren of practical results. With budgets becoming so large and complicated that even those who prepare them can hardly grapple with their intricacies, it seems well nigh hopeless for an individual citizen to accomplish anything tangible because he doesn't know how or where to head into the problem. It may be well nigh hopeless, but it is not entirely so.

There are scores of thousands of taxpayers who have banded themselves together in all parts of the country to work in detail on the budgets of their respective localities to cut down the cost and improve the efficiency of government. These local taxpayers' associations are organized into state groups who exchange information as to effective ways that have been developed to cut down public budgets. Such state taxpayers' associations are in existence in New York, Nebraska, Indiana, Missouri, Massachusetts, New Jersey, Pennsylvania, Illinois, New Mexico, California, Iowa, Kentucky, Utah, Minnesota and other states.

In our country there are over 175,000 local political subdivisions, each and every one collecting and expending the taxpayers' money. These comprise counties, towns and villages and school, water, fire, sewer and many other taxing districts. The saving of needless expenditure in each of these taxing units would run into hundreds of millions of dollars annually. But it would do a great deal more. Everyone who has labored to effect economies in his own bailiwick becomes correspondingly conscious of what his State or Federal Government could do by pursuing the same methods. Local taxpayers who have made such a study and such a fight, affect the thinking of local voters and local officials. The aggregate of their efforts is and will be to make people more tax minded and this is bound to be reflected in the State Legislatures and in the halls of Congress. It will become "smart to be thrifty."

Performance at the Grass Roots

I know of no more practical way to attack this problem than at the grass roots, which is after all where all big movements must begin. Let me give a few examples of hundreds that could be cited to show what has been done already —all the result of the efforts of local taxpayers and businessmen to improve the efficiency and reduce the cost of their local government.

Montclair, N. J.—Lowest tax rate in 13 years. $8,000,000 cut in assessments. $1,685,000 reduction in town debt. $500,000 surplus at last year-end.

New York State—Cut in state budget $26,500,000. Aggregate cuts in 51 counties $28,000,000.

Nebraska—(10 year period) Reduction in property taxes $159,000,000. Reduction in debt of local government units $38,000,000.

South Bend, Indiana—(6 year record) Taxes reduced 38 per cent. Bonded debt reduced 40 per cent.

These results, which were conveyed to me by the Tax Foundation of New York, can be equaled by many others from all parts of the country. To me an impressive thing about them is, not only the great aggregate that such savings come to, but that in many cases they began with a small group in one small community in the state and spread out from that center.

We are prone perhaps to overemphasize the Federal, as compared to State and local, expenditures, due perhaps to the fact that the Federal expenditures have grown at so much greater a rate (4½ fold since 1915, compared to about 3 fold for State and local). It should not be overlooked however that for 1939 State and local taxes still form 61 per cent of total tax collections. Hence in hewing at local taxes we are not only working where we can do so most effectively, but are also chopping at the larger of the two trees.

THE CLOSED SHOP ISSUE

By H. W. Story

Vice President and General Counsel, Allis-Chalmers, Manufacturing Co., Milwaukee

Adapted from an address presented at the seventh annual conference of the Southeastern Electric Exchange, in Roanoke, Virginia, May 9-11, 1940.

THE ARGUMENT is often made that unions will continue to demand closed shops and strikes will prevail, because the very existence of the unions depends upon the granting of this demand. It is claimed that if this issue is out of the way, the leaders can go about more constructively and with greater freedom in working toward the success of the employer.

Experience has indicated that the granting of a closed shop demand does not solve the problem. It merely means that when union leaders are relieved of the job of maintaining their organization they have more time to work on new and different demands. It is normal, where a closed shop is granted, that the union immediately sets about limiting output; in other words, controlling the amount of production put out by the shop force.

Even with a closed shop setup, labor leaders must hold their jobs. In order to get the necessary votes they must be militant in their de-

mands. So that the granting of a closed shop solves no problem. The question of labor relations is a matter of human relations. It depends on the philosophy, personalities and ideas of a people that are thrown together in such relationships. If both parties do not have the proper attitude, the relationship will be unhappy and full of strife.

Suggested Program

As a complete answer to the closed shop issue and as a long-range program which has the greatest possibility of success under all conditions, I suggest the following:

1. Select our top executives who command respect, that is, who have courage, integrity, and intelligence.

2. Adopt as a fundamental basis of labor relations the attitude of "fairness and firmness."

The attitude of "fairness" would mean the purpose to do everything possible for employees consistent with the rights of stockholders and the proper safeguarding and perpetuation of the company. This attitude would be effectuated by the advertent placing of management in the position of the employee in considering any question of labor relationships.

The attitude of "firmness" would mean the maintenance of reasonable discipline which would include proper consideration for, and the support of, the shop supervisory force.

3. Adopt a definite policy as to activities of majority and minority labor groups on company premises.

The following is recommended as a realistic and sound policy:

(a) The majority group should have privilege, upon company premises but not on company time, of soliciting members; of receiving dues; and of posting proper union notices on company bulletin boards;

(b) The minority group should have no privilege to carry on organizational work on company premises;

(c) No employee should be permitted to intimidate or coerce fellow employees under any circumstances.

4. Work out an effective comprehensive labor policy through the establishment of a labor code which would be a compilation of all company rules and regulations of all kinds (including collective bargaining arrangements).

The initial draft of the code would be made by top management. Then, through an intensive course of study, it would be submitted to the line management organization for critical comment. It would be finally submitted for comment to the labor organization representing the majority.

The working out of a code would show up the existence of obsolete and inaccurate rules and understandings. The mere making of the code would constitute an excellent method of educating the line organization.

5. Institute and maintain a course of foremen training which would include:

(a) All phases of the collective bargaining relationship; and

(b) A course in applied psychology designed to train foremen in the proper handling of men.

6. Maintain a modern system of job rating and merit rating.

Job rating is the only method for effectively handling the broad questions of wage differentials based on skill and ability, particularly under a collective bargaining setup.

Merit rating means the keeping of a continuous record of a man's performance so that he would be rewarded by a proper rate placement in his job classification, or disciplined for below standard workmanship, as the case might be.

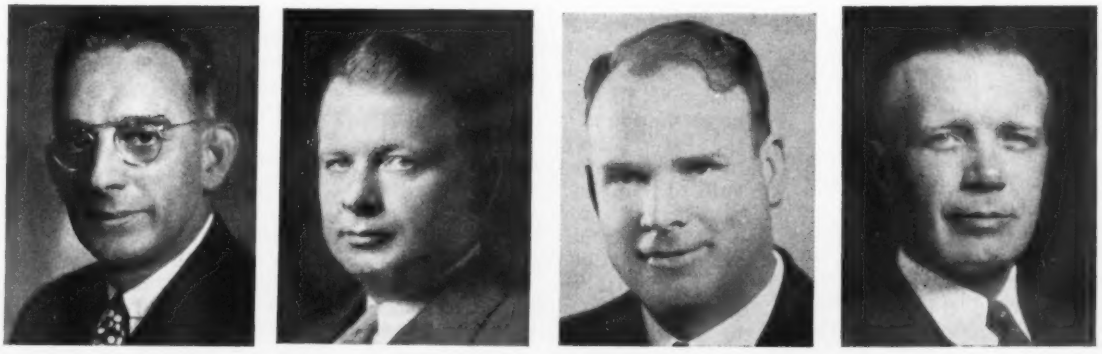
WHAT IS AN INTEGRATED ELECTRIC UTILITY SYSTEM?

By Philip Sporn

Vice President and Chief Engineer, American Gas and Electric Service Corp., New York.

Summary of an address presented at the seventh annual conference of the Southeastern Electric Exchange, in Roanoke, Virginia, May 9-11, 1940.

THE COMPLEX nature of the problem and the many phases of electric utility system development and operation that need to be considered to determine whether a system is an integrated public utility system were pointed out by Mr. Sporn, who said that he would confine his discussion to three phases of electric utility system operation, these being:



These men have directed the work of the various sections of the Southeastern Electric Exchange during the past year. Left to right, R. B. Roberts, general sales manager, Florida Power and Light, chairman of Sales Section; R. I. Butterworth, general superintendent, East Tennessee Light and Power, chairman of Engineering and Operations Section; W. A. Moore, vice president, Mississippi Power and Light, chairman of Employees Activities Committee; and Herman W. Boozer, general auditor, Georgia Power Co., chairman of Accounting Section.

(1) Historical development of a system, that is, how did it get that way?

(2) How does it operate? Can it and does it operate economically as a single interconnected and coordinated system?

(3) The effect of the state of the art on the size of the system that can be integrated.

Discussing them in order out of the experience of the American Gas and Electric Company, he pointed out how the present Central System of that Company, starting with a nucleus in 1907 which comprised four communities in Indiana, Ohio and West Virginia with a total peak load at that time of 4,610 kw, has developed by a process of integration of existing facilities and by expansion of new facilities into communities that never had electric service before, into a power system that now serves over 1400 communities with an average population of 1900, with over 648,000 consumers, with a 1939 peak demand of 909,000 kw and a 1939 system input of close to 4,760,000,000 kwh.

This system has at the present time a capacity of over 190,000 kw of hydro capacity, over 980,000 kw of steam generating capacity, and has under construction some additional 201,500 kw of steam capacity of which some 86,500 kw will go into service in 1940 and the balance in 1941. The high tension network consists of 1390 miles of 132,000 volt transmission, most of which is double circuit, so that there are some 2359 circuit miles of 132,000 volt line linking and tying together every important load center on that system.

By a series of historical maps showing the status of the Central System at various periods in the course of its development, Mr. Sporn traced the development of generation, transmission and distribution facilities on a system basis and on a basis to make available to every community on the system the advantage of integrated system development and operation.

In that process small isolated inefficient plants were shut down and well located plants were expanded, new plants properly located with regard to fundamentals of sound generation, including coal supplies, and water supplies for condensing purposes were built, and every important load center was connected by and to the high tension 132,000 volt network.

As a consequence, all communities on the system are not only able to have ample supplies of power but are able to get the advantages of highly economical energy sources and the advantages of utmost reliability in service supply that can come only from a large well interconnected system.

Mr. Sporn, in discussing the actual operation of the system, pointed out again by example how closely coordinated the Central System is in its day to day functioning and how having been soundly built from a fundamental standpoint is operated closely coordinated from day to day so that the maximum use is made of facilities, and the most efficient facilities are always brought into play to give the most economical supply. Also, the entire system is closely coordinated so that regardless of what emergency or extraordinary conditions may develop on any portion of the system, the rest of the system always comes into play to make up the deficiency and assure continuity of supply even in the most stringent emergency.

In discussing the state of the art, he pointed out again by example from conditions that existed in 1915, how technological developments, many of which were sponsored and developed by the engineers of the American Gas and Electric Company, have resulted in removing of barriers of distance and in making possible the complete and close coordination of the system extending from southwestern Michigan to the Virginia-Carolina border.

He showed how by utilizing the transmission system towers and high frequency currents over the power wires most reliable communication is maintained between all important and strategic points on the system, and how again by taking advantage of other developments, readings of system conditions relating to power supply transmission and distribution are sometimes brought in instantaneously from points hundreds of miles distant to the control and dispatching points so that under all conditions complete and coordinated operation of the system can be carried out.

In this same connection he finally showed how through devel-

(*Continued on page 62*)

THERE IS WORK TO BE DONE

By C. E. Swartzbaugh

President, National Electrical Manufacturers Assn., New York

Adapted from an address presented at the seventh annual conference of the Southeastern Electric Exchange, in Roanoke, Virginia, May 9-11, 1940.

IT IS MY belief that the American people will soon demand a change—demand some new instrument of national policy at present missing that will restore the ever advancing standard of living to which they have long been accustomed, for after all, sound economics is found on the farm, about the stove in the country store, and in the backwoods, as well as in the halls of industry. Sometimes even sounder economics is found there.

But if the time when this change occurs is to be hastened—if we are to assist the uniform, constant, uninterrupted effort of man to better his condition, then we as representatives of business—of private enterprise—of an "American way of life" must soon become vocal.

We need now to remind ourselves that our industrial institutions are *greater* than their product—to remind ourselves that if the public holds the product in high esteem, it is our fault if the institution that produced it is damned.

And remembering that it's always easier to argue *against* something than argue *for* it—let's familiarize ourselves a bit with the record, using this statement as our basic premise:

> "The flux which made possible the welding of America's divergent resources and has made the United States the greatest nation on earth was the American System of Free Enterprise."

While the United States is a large country, it is exceeded in size by Canada, Brazil and the Soviet Union.

With a population in excess of 130 million, we have fewer people by far than either China's 450 million or Russia's 170 million.

Despite our great natural re-

sources, these are in some respects equalled and in others exceeded by both the British Empire and the Soviet Union.

So it must be apparent that some other factor is present in our economy that has made the United States the envy of the world economically.

I suggest that that factor is the "American system of free enterprise."

I submit for your consideration that it is the flux which under a liberal constitution has welded our mixed and divergent racial origins into a unified whole—which has permitted, yes, augmented the exploitation of our natural resources and advantages to a fuller extent than has been possible in any other country.

Now, no thinking person will claim perfection for any economic system—the "American system of free enterprise" never has been, is not now, and never will be perfect—but if you had a football team that won most of its games despite a weak right guard, would you have the tackle and center support the weak guard—or would you cancel your whole schedule?

The fact that at times weakness appears in our economic system is no justification for destroying a system that has produced such satisfactory relative results.

There has been, and I fear always will be some maldistribution of wealth under the American system of free enterprise or any other economic system—but there are more millionaires in either China or India than in the United States.

One can sympathize with the low income groups—we can and do deplore the plight of the wretchedly poor—but the fact remains that under our economic system there are proportionately fewer people at the bottom, fewer people at the top, and more people in the comfortable middle class in the United States than in any other comparable nation you can think of.

And as evidence of the evolutionary development and improvement of our economic system, I submit for your consideration that the totally unemployed of today—(even prior to the advent of the New Deal) are better housed, fed and clothed as a rule than many of the fully employed of 50 or 60 years ago.

Under the American system of free enterprise we have developed the highest standard of living that has ever existed anywhere on the face of the globe—despite which

Charles E. Swartzbaugh

we seriously concern ourselves—and rightly so—about our lowest income groups. And despite which standard, we have in the United States—(and for this I say, with all due reverence, "Thank God")—the only organized system of charity which exists in any country anywhere.

Well, how far have we progressed in a little over 150 years under the American system of free enterprise?

Less than 150 years ago—

1. There wasn't a public library in the United States.
2. The *only* hat factory made cocked hats.
3. Crockery plates were objected to—they dulled the knives.
4. For a day laborer, 35/40c was good pay.
5. Buttons were scarce — but wooden pegs served a purpose.
6. Beef, pork, salt fish, potatoes, hominy—were our standard diet.
7. Almost all of our furniture was imported from England.
8. Two stage coaches carried all traffic between New York and Boston.
9. And this State of Virginia contained one-fifth of the U. S. population.

And today—with only 6% of the world's population—we have:

1. 71% of the world's automobiles.
2. 52% of the world's telephones.
3. 40% of the world's radios.
4. More refrigerators and more bath tubs than all the rest of the world put together.
5. 43% of our homes are owned by the occupants.
6. Over 64 million policy holders are insured for more than 24 billion dollars.
7. 44 million savings bank accounts for a total in excess of 26 billion dollars.
8. 4¼ million stockholders in our 110 largest corporations.
9. We have a 12 billion dollar educational plant, costing 3 billion yearly to operate it.
10. We employ 76,000 people per 1 million of population today as compared to 41,000 per million in 1850.
11. We pay about 66% of the national income to workers.
12. We spend $10 billion annually for recreation—just to amuse ourselves.
13. And the per capita income of 47 of our 48 states exceeds the per capita income of any other country in the world.

That's quite a record—incomplete as it is.

And *not one dollar of that wealth was ever produced by Government,* or by any political party. Nor was it created by taxes—for a tax dollar is a sterile dollar whereas a dollar in farming, business or industry goes to work to produce another dollar of value.

Even during our past ten years of depression, private enterprise has been busy, even if not vocal. Busy with research—new inventions—redesign of old products—development of new ones—refinement of processes. Business never voluntarily stands still under our economic system—business moves forward or it dies, and in the process of moving forward it constantly produces new products creating new jobs, and new wealth.

From the Wall Street Journal, I quote the following:

"In ten years of depression we've come to think of business as idling, private enterprise stymied, progress retarded. Yet here are some of the things we take for granted today that we didn't have, or hadn't begun to use, as short a time ago as 1929:

"Streamline trains. Television. Transoceanic passenger air service. Synthetic rubber. Fluorescent lighting. Colored home movies. New plywoods, stronger than steel. Half a dozen new plastic and resins. Polarized glass. Glass building blocks. Fiber glass for insulation and textiles. Synthetic hosiery replacing silk. Synthetic vitamins and hormones. Sulfanilamide, drugs that kill the deadly streptococcus germs.

"Don't ever believe the country's future lies behind it. Inventive genius and business enterprise never stand still."

Advertising Value Stressed At Arkansas Meeting

CONVINCING evidence indicates that the electric and gas industries need more advertising, speaker after speaker told the members of the Arkansas Utilities Association at its annual convention on April 15 and 16 at the Eastman Hotel, in Hot Springs, Ark. They emphasized the great value obtained from advertising at small cost.

Not only was this fact emphasized in the general sessions, but at the sectional meetings. One speaker presented a striking demonstration of advertising's value, and another reported the results of a wide survey to show the great need for its use.

Representatives of the industry who have attended most of the conventions held during the association's 29 years of existence reported the 1940 meeting the best ever held. The final session was featured by the election of officers. D. H. Thurston, manager of the Arkansas Louisiana Gas Company, El Dorado, was elected president, succeeding R. H. Teed, vice president and general manager of Public Utilities, Hot Springs National Park. W. F. Thomas, manager of the Southwestern Gas and Electric Company, Fayetteville, was elected first vice president; A. B. Harper, president, Fort Smith Gas Company, Fort Smith, second vice president; R. E. Ritchie, assistant to the president and manager of the Little Rock division, Arkansas Power and Light Company, was reelected secretary-treasurer.

H. Freeman Barnes, sales promotion manager of the General Electric Company, Cleveland, O., scored the first hit of the series on the need for increased advertising in the second talk of the opening session. After discussing at length the value of advertising, he asked his audience if any member believed advertising does not pay. Ed Barry, of the Hot Springs utilities, asserted he could see no value in advertising. Invited to the speaker's stand, Barry was asked to look at the name of his hat. Finding it to be a widely advertised brand, Barnes tossed it aside, asserting, "It's no good, it's advertised." Barry's shirt, also found to be a widely advertised brand, likewise was discarded, as were his shoes. When his coat was found to be an advertised product, that was tossed aside too, but Barry fled when Barnes asked him to take off his pants. As he departed, Barnes pointed out that firms that believe in advertising to let people know of their products are the ones who have attained a place in the business world of the nation.

"They didn't get there by just placing one advertisement in the newspaper or magazine," Barnes asserted. "They kept at it. Advertising arouses the imagination and paints a picture. It has a definite appeal and motivates a desire to buy what is advertised."

R. W. Winsborough, advertising manager of the Middle West Service Company, Chicago, talking on "What the Customer Thinks," pointed out the results of a survey in 14 states which showed conclusively a need for more consistent and better planned advertising.

Clarence F. Byrns, editor of the *Fort Smith Southwest-American*, large morning daily newspaper in Fort Smith, drove the point home even further in his talk on "The State Made for Man." But in addition to harping on the need for more advertising, Editor Byrns launched out in a fiery attack on governmental regulation of business. "There has been too much power concentrated in government agencies in Washington," he asserted. "When government tries to do what private industry has done and should continue to do, it simply stops progress. You can't place a curb on inventive genius or the minority opinion."

Asserting that the Federal Communications Commission has stifled the development of television, Byrns asked, "What would have happened if Edison had been told he couldn't develop his electric light? If Bell had been told he couldn't develop his telephone? Or if Marconi had been told he couldn't develop his wireless?"

"We have got to get away from making man to fit the state," he asserted. "And get back to making the state to fit the man." His talk was greeted with round after round of applause.

Of particular interest to the convention was a talk by Col. C. S. Lynch, chief engineer for the Arkansas Power and Light Company, Pine Bluff. Colonel Lynch's company has built two large hydro-electric dams on the Ouachita river in the vicinity of Hot Springs and contemplates a third when the load becomes such that it will be economically practical. There has been some agitation in Arkansas to build the dam immediately. In his talk on "The Economics of Water Power," Colonel Lynch pointed out that because of the wide variation in stream flow on

D. H. Thurston of El Dorado, Ark., manager of the Arkansas-Louisiana Gas Company properties, is the new president of the Arkansas Utilities Association, succeeding R. H. Teed of Hot Springs, manager of the Public Utilities of Hot Springs National Park. Mr. Thurston (left) is shown discussing plans for the coming year with Mr. Teed at the annual convention of the association in Hot Springs.

rivers in Arkansas and other states in the central part of the country, power produced by dams is useful for peaking purposes only, and there must be a load in which it can be fitted advantageously before it becomes valuable.

"Not knowing about or realizing the variation in stream flow, the general public has formed an exaggerated opinion as to the practical value of power produced on Arkansas streams," he said. His talk was made very interesting through the use of glass models of load curves in which he used clear white sand to represent the various loads that could be obtained from stream operated and water operated plants.

At the annual breakfast of the convention, held Tuesday morning, April 16, Harvey Couch, president of the Arkansas Power and Light Company, centered his talk around the need for aiding the development of mechanized industries, and urged the attention of all interested in progress toward getting industries that would manufacture products now being shipped in from great distances.

"To try to stifle mechanized industry by replacing it with hand labor is merely to stop progress," he said. "The theory that machinery replaces men and causes unemployment has not proved true. Machinery has created employment and permitted progress. It is wrong to think of trying to stop development of machines. Machines bring speed, and speed brings reduced prices, and reduced prices permit increased production, and this enables more people to enjoy the benefits of progress."

C. Hamilton Moses, of Little Rock, law partner of the late Senator Joe T. Robinson, of Arkansas, brought the convention to a close Tuesday noon with an address in which he pointed out that representatives of the utility industry have nothing to be ashamed of and everything to be proud of. "No business has been so worthwhile in its service to the average man and woman, and so continuously efficient in improving living conditions of our average citizen, as ours," he said.

"Paying out approximately 16 cents of every dollar it takes in for taxes, the utility industry in 1939 expended more than $345,000,000 in different kinds of taxes, and today the utility customer gets 10 times as much for the same money as he did 15 years ago.

"Working conditions for the industry have improved. The work week for the average utility employe has dropped from 44 hours to 39, the weekly wage has increased from an average of $31 to $34, all in 10 years. Despite the criticisms that have been made of the industry by selfish interests, the industry has gone along continuously improving service, extending its efforts, and reducing rates!"

Sectional meetings of the convention were held the first day. Kenneth Johnson, industrial sales engineer for the Arkansas Power

(*Continued on page 62*)

June E. E. I. Convention Covers a Wide Scope

NATIONALLY known leaders of business, and engineering, sales and accounting authorities, both in the electrical industry and in other fields, were the speakers at the Eighth Annual Convention of the Edison Electric Institute, being held at Atlantic City June 3-6, inclusive. This list announced by the Institute includes Howard Coonley, chairman of the board, National Manufacturers Association; Alex Dow, president, Detroit Edison Company; Samuel Ferguson, president, The Hartford Electric Light Company; Colonel Robert S. Henry, assistant to the president, Association of American Railroads; C. E. Wilson, president, General Electric Company; and Dr. Lionel D. Edie, consulting economist.

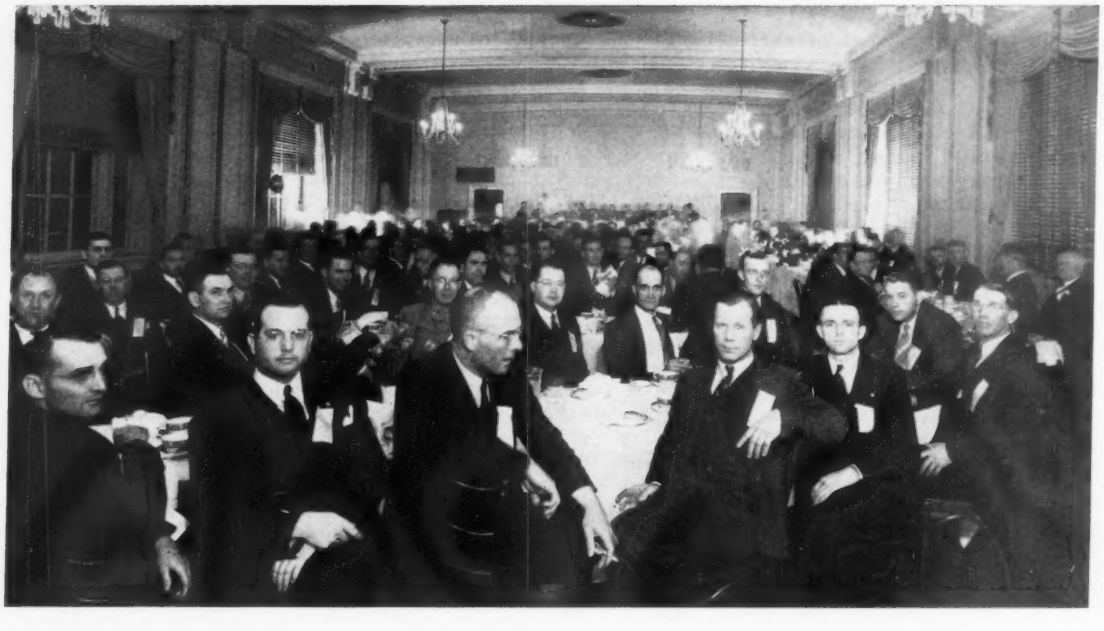
The business program of the convention, as it took final shape, was assembled with the broad aim of spotlighting in turn every activity of major importance to the electrical industry and, further, of considering the general problems which are currently of vital interest to all American business.

In addition to Mr. Wilson of General Electric, the electrical manufacturers were represented on the platform by Ralph Kelly, vice president, Westinghouse Electric and Manufacturing Company. Two speakers from the general field were Dr. Hugh Grant Rowell, of Teachers College, Columbia University, and R. W. Leach, of Unemployment Benefit Advisors, Inc., Washington, D. C.

The list of utility executives who were to speak includes: Paul M. Downing, vice president and general manager, Pacific Gas and Electric Company, San Francisco; C. L. Campbell, president, Connecticut Light and Power Company; H. P. Liversidge, president, Philadelphia Electric Company; Edwin Vennard, vice president, Middle West Service Company, Chicago; H. R. Woodrow, vice president, Consolidated Edison Company of New York, Inc.; George Ousler, Duquesne Light Company, Pittsburgh; H. L. Wallau, Cleveland Electric Illuminating Company; Kinsey M. Robinson, president; Washington Water Power Company, Spokane; E. L. Hopping, Philadelphia Electric Company; James M. Stafford, Georgia Power Company, Atlanta; H. P. Seelye, Detroit Edison Company; C. E. Kohlhepp, Wisconsin Public Service Corporation, Milwaukee; Bernard S. Rodey, Jr., Consolidated Edison Company of New York, Inc.; F. A. Newton, The Commonwealth and Southern Corporation, New York; and C. W. Kellogg, president, Edison Electric Institute.

General sessions were held in Atlantic City's Convention Hall and will be open to all wishing to attend. C. W. Kellogg, president of the Institute, had extended a cordial invitation to all electric utility companies, including nonmembers of the Institute, and to electrical manufacturers.

Monday, June 3, the opening day, had been set aside for registration, committee meetings, and informal activities. The first of five general sessions was to begin at 9:30 A.M., Tuesday, June 4, with another on Tuesday afternoon, two on Wednesday, and one on Thursday morning. A special session on Wednesday evening, also in Convention Hall, heard a forty-five minute musical program by well known concert artists. Formal activities ended Thursday afternoon with a luncheon-meeting in the American Room of the Hotel Traymore. Immediately following this, a special train carried many of the delegates and guests to New York, where Friday, June 7, has been designated as Edison Electric Institute Day at the New York World's Fair.



North Carolina Contractors Hold Industry Meeting

OVER two hundred members of North Carolina's electrical industries met in the ballroom of the O'Henry Hotel in Greensboro May 2 for the annual meeting of the North Carolina Association of Electrical Contractors. O. W. Holmes, of Fayetteville presided, and presented H. M. Horton, General Electric Company illuminating engineer, as the morning's first speaker, discussing fluorescent lighting.

Mr. Horton began by saying that he had rounded out twelve years' experience in the industry, and that not only equipment, but conditions and demands of interior lighting have changed vastly in that decade. He pointed to the tendency ten years ago to place emphasis on shading of light, and on highlights and shadows, without regard to the total illumination value produced. This, he said, started going out with the innovation of 750 and 1000 watt bulbs some years ago.

In taking advantage of the opportunities offered by fluorescent lighting, Mr. Horton stressed its position as a new tool for the electrical contractor, and emphasized the necessity of the contractor's understanding all his tools. He dwelt primarily on the merchandising possibilities of selling fluorescent lighting, showing numerous slides of model installations, with data as to benefits accruing to the establishment. The Martha Washington Candy store in New York was illustrated, and figures on the increase in candy sales were quoted. The Museum of Fine Arts in Cleveland was another installation depicted, where fixtures comprising four 18-inch daylight fluorescent lamps covered with iridescent glass are used. Other installations discussed were in drug stores, food stores, cafes.

For merchandising, Mr. Horton recommended that emphasis be placed on the increase in percentage of illumination value, the decrease in heat generated, economy in current consumed, enhanced appearance of merchandise on display. He urged, however, that footcandles of sufficiently high levels be used, stating that an insufficient quantity of fluorescent lighting presents a detracting effect on the appearance of goods. His discussion closed with a technical demonstration and the pointing out of several pitfalls in major installations. One of these, he said, was the hum which occasionally comes from the auxiliary, which can be eliminated by locating it in the basement or encasing in a celotex box.

Problems and objectives of the state electrical authority were discussed by N. E. Cannady, state electrical engineer. In 1905, he said, North Carolina took on the task of regulating the electrical industry, and "Sales Control Laws" were passed. Knowledge of many electricians was inadequate at that time, he said, but a high standard of uniformity has since been achieved. The elements which the state has to deal with today are, he said, the weeding out of uninformed men in the field, and securing the cooperation of individuals in the industry to promote high standards. The National Electrical Code for 1940, he said, is five times the size of the Code book of 1919, and the constantly increasing complications make a higher standard of technical knowledge necessary.

Adequate wiring was discussed by Roy A. Palmer, Duke Power Company, Charlotte, who emphasized the value of a well-planned adequate wiring campaign as giving the salesman and contractor something tangible to sell. He

urged cooperation in distributing adequate wiring literature and material to make the service rendered by adequate wiring facilities a tangible reality to the public.

A brief report from the State Board of Examiners of Electrical Contractors was delivered by Frank Hartis, of Durham, N. C., in which Mr. Hartis traced the development of the board and its control. There are now 850 contractors holding approved licenses, he said, with many applications on file.

Thin-Wall Wire Discussed

R. W. E. Moore, sales manager of National Electric Products Corp., of Pittsburgh, discussed the possibilities of small diameter building wire, stressing the angle of "More Current." Mr. Moore traced the unprecedented period of building from 1905 to 1930, and the incident utility expansion. As demand for more lighting grew, and new factors such as air-conditioning entered the picture, demanding more load, the average of adequately wired buildings decreased; today, he declared, 90% of the structures in the country are inadequately wired for their present day requirements. This creates a tremendous field for rewiring, he said, and a demand for contractors' services.

Specifications of small diameter wire for such purposes were discussed by the speaker. Type "R," he said, will be the minimum standard to be used. Type "R" wire was identified as the moisture resisting type, used for conductors in moist, damp places. Type "RP" and type "RH" were presented as new developments in rubber insulation. "RU", "RPT", "RHT" and "SM" were recommended for rewiring, being constructed with thinner insulation. Type "RU" is insulated with latex, and "SN" with a synthetic compound.

The widespread use of smaller diameter wire will involve revision of present Code tables, he concluded, and work is going forward rapidly on the new Code which will be published later this year.

The meeting was concluded with discussions of the activities of the national association by Laurence Davis, general manager, National Electrical Contractors' Association, and of the state association by Ralph Robinson, Charlotte, N. C. Twenty years ago, said Mr. Davis, talk and activities were along the lines of increasing individual trade; today the trend is organized research for new markets for the industry as a whole. He stressed the existence of extensive opportunities throughout the field, and stated that the N.E.C.A. will soon present a manual, the major purpose of which will be sales development. Two objectives will be stressed: "How to Sell" and "Where to Sell."

One project of the national organization of which much is expected is the appointment of committees to make a statistical survey of the electrical wiring field, and the market potentials therein.

C. E. Swartzbaugh, president of the National Electrical Manufacturers' Assn., was the principal speaker at the banquet in the evening. Officers named were Ralph Robinson, Robinson Electric Company, Charlotte, president; E. C. Peele, Peele Electric Company, Burlington, vice president; Frank Hartis, Modern Electric Co., Durham, secretary; D. J. Thompson, Thompson Electric Company, Raleigh, treasurer; and Leon Kite, Charlotte, field representative.

Exhibition Lighting "Pays Off" Twice

(Continued from page 22)

Consequently they are most likely to take their installation problems to whomever appears to them to have an expert knowledge.

Directional committees, acting for organizations sponsoring pageants and exhibitions of all kinds, are largely composed of business men, who easily can turn to the committee's lighting contractor, when they have similar problems of their own to be solved. At least that has been La Vigne's experience.

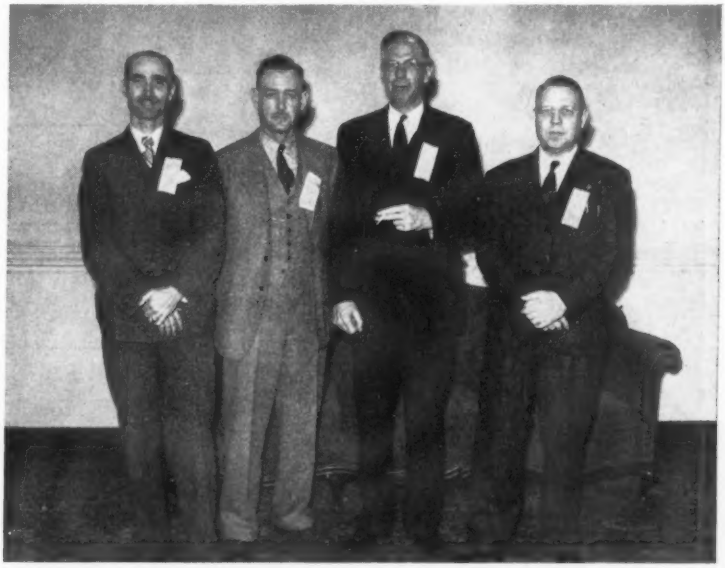
La Vigne Electric has made several display lighting installations, which it credits to such contacts.

"The value of the contacts we make with organization committee personnel," says Mr. Ferguson, "cannot be reduced to definite figures but we know that they have brought us a great amount of business that otherwise we might not have had."

Furthermore, the operation of its temporary illumination service, in his opinion, has brought La Vigne Electric a vast amount of favorable publicity impossible to trace into the ledger. To capitalize on this angle, installation and maintenance men wear lettered uniforms.

La Vigne has made a number of stage lighting installations, including that in one of the more elaborate motion picture houses at Miami Beach.

In direct profits, additional business and advertising, it is safe to say that La Vigne Electric's special illumination service brings at least a double "pay off."



New officers of the North Carolina Association of Electrical Contractors, elected at the Association's annual meeting in Greensboro on May 2. Left to right are Leon Kite, field representative; E. C. Peele, Burlington, vice-president; Ralph K. Robinson, Charlotte, president; and Frank E. Hartis, Durham, secretary. Not shown in the photograph D. J. Thomas, Raleigh, treasurer.

Understanding and Using the National Electrical Code

By B. Z. Segall

New Orleans Public Service, Inc.
New Orleans, Louisiana

IN this thirteenth article of his series on the Code, Mr. Segall continues his discussion of the requirements relating to services, as covered in Article 230. Other articles in this series have appeared in foregoing issues, beginning in April, 1939.

THE Code at the present time requires that service conductors which are to operate above 7500 volts must be brought directly into the service protective equipment located within an approved vault. A change has been recommended whereby services which do not exceed 15,000 volts between conductors may be brought directly into a metal clad switchgear, which does not have to be enclosed in a vault.

Overcurrent protection for high voltage services must be provided by an automatic circuit breaker. The Code allows two exceptions to this general rule. Both exceptions are based on the installation of the service equipment in an approved vault.

The first exception provides that: (a) the voltage must be less than 25,000 volts between conductors, and, (b) the load must not exceed 200 kva per phase. Under these conditions a manually operable oil switch in combination with approved fuses may be used.

The second exception is based on a further limitation of the load and service voltage. If (a) the voltage is 5000 or less between conductors, and (b) the load does not exceed 100 kva per phase, then only the approved fuses need be installed.

The fuses generally have oil immersed fusible elements. In addition, they are arranged with a strain wire and spring. The oil of course smothers the arc and the spring quickly increases the gap after the fuse has opened. Most of the fuses are constructed so that the circuit can be safely opened by the fuse itself. However, for frequent circuit opening it is best to install an oil switch ahead of the fuses.

Several changes have been suggested for these two exceptions. The changes are so worded as to be a more comprehensive guide in the selection of overcurrent protection for high voltage services. In the case of services operating at 25,000 volts or less, the load limitation of 200 kva per phase has been eliminated.

The fuse specifications, however, are more definite in that the requirements state that the fuses must have an interrupting rating equal to the maximum short circuit current possible in the circuit. Of course, this has the same effect of limiting the kva capacity but at the same time leaving the field open for the further development of fuses which may safely and effectively take care of larger loads. In addition, the suggested rule would allow a non-automatic trip circuit breaker to be used as well as the non-automatic oil switch which is permitted in the present Code.

The suggested changes for the second exception would completely revise the intent and wording of the present section 2390b. The reference to 5000 volts and the limitation of 100 kva per phase have been deleted. In its place four requirements are setup:

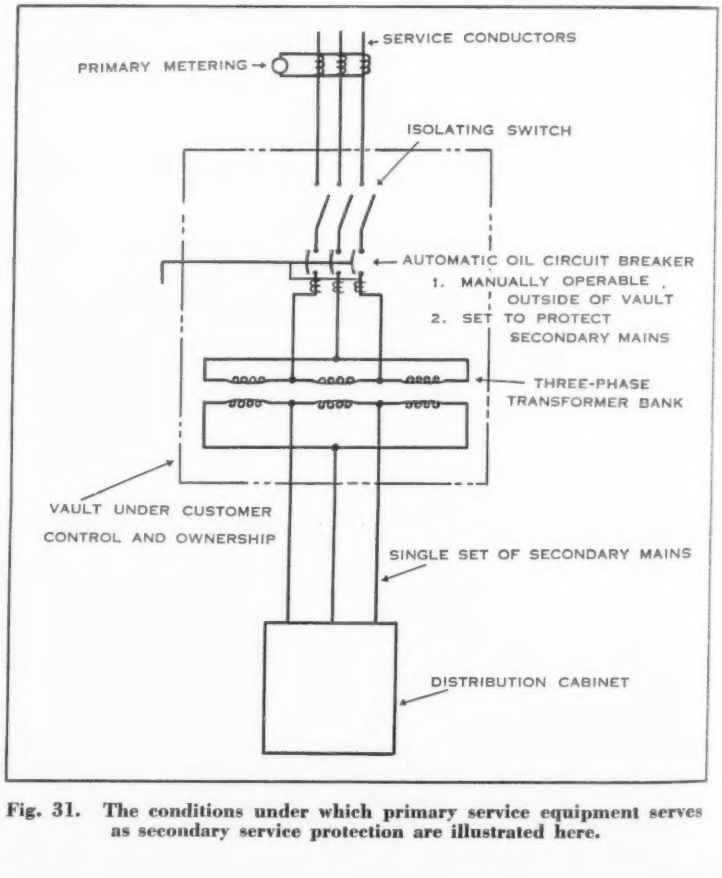


Fig. 31. The conditions under which primary service equipment serves as secondary service protection are illustrated here.

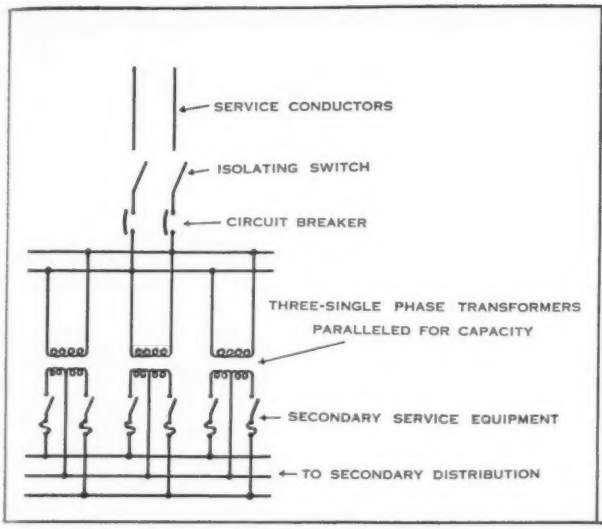


Fig. 32. Paralleled secondary feeders require both primary and secondary service equipment.

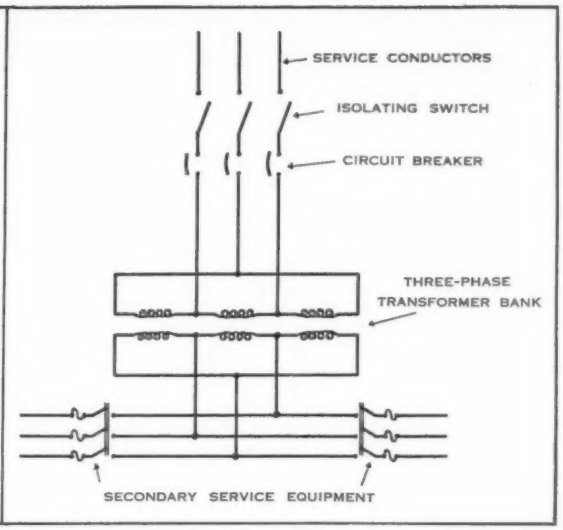


Fig. 33. An installation involving two or more secondary mains requires primary and secondary service equipment.

(1) The fuse must be oil filled or of some other suitable type capable of being operated as a disconnect switch.

(2) Such fuses may be used on services not exceeding 2500 volts to ground and rated at a maximum of 300 amperes, or

(3) If the service exceeds 2500 volts but is less than 7500 volts, the maximum fuse rating must be 100 amperes.

(4) As in the case of the first exception, the fuse must have an interrupting rating at least equal to the maximum short circuit current possible in the circuit.

Two General Requirements

For all conditions of service entrance other than those outlined above in the two exceptions, the requirements for the overcurrent protection of service conductors are covered by two main requisites.

(a) An automatic circuit breaker must be used. The breaker must: 1. have suitable current carrying capacity; 2. have ample interrupting capacity; 3. have an overcurrent device for each ungrounded conductor; 4. be so arranged as to open all ungrounded conductors when any one of the overcurrent units operate; 5. clearly indicate whether it is in open or closed position; and 6. be free to open in case the circuit is closed on an overload.

(b) The breaker must be located: 1. as near as possible to the point of service entrance into the building; or 2. on a pole outside the building but must under all conditions be so located and arranged as to be manually operable from a point which is readily accessible.

There are several points about these requirements which should be emphasized. First, with reference to the interrupting capacity of the breaker. The service breaker must be so designed as to open up the circuit safely and without causing any damage to itself in the event a short circuit develops on the load side of the breaker.

Another requirement is that the breaker must be free to open in case the circuit is closed on an overload. The Code outlines several methods which are acceptable for accomplishing this safety feature: (a) Trip free linkage may be used. (b) Multiple breakers with individual handles for each pole are also acceptable. (c) If an air circuit breaker is used, a switch placed in series with each pole of the breaker will offer sufficient protection.

The rule requires the breaker to be so located as to be readily accessible. This definitely precludes the use of manually operable breakers in transformer vaults without providing some means of operating the breaker manually from a point outside the cabinet or vault.

The disconnecting means for these high voltage services is automatically obtained when the circuit breaker, or switches and fuses are installed as outlined in the above discussion.

Under certain conditions an additional switch must be installed for services operating above 600 volts. These disconnects must be isolating air break switches, located ahead of all service equipment and as such are to be operated only after the load has been disconnected from the source of supply by the service circuit breaker, switch or fuse. The purpose of the isolating switch is to cut off all source of supply to circuit breakers, etc., so that these may be inspected, repaired or replaced in safety.

Where removable truck panels or metal clad switchgear units are used for mounting the service equipment, the isolating switches are not required provided: (a) The truck panels or switchgear units cannot be opened unless the circuit is disconnected; and (b) the removal of these panels or units from the normal operating position automatically disconnects the service equipment from all source of supply. In most cases the equipment referred to above is so constructed that the entire panel or unit may be removed and rolled out completely away from the switchboard.

Fuse as Isolating Switch

The fuses used in combination with the non-automatic oil breaker for 25,000 volt services or less as described above, may serve as the isolating switch if: (a) They may be operated as a disconnect switch capable of interrupting the load current. (b) They completely disconnect the oil switch and service equipment from the source of supply. To provide ad-

(Continued on page 64)

APPLIANCE Service

Modern Methods of Metering Refrigerants Discussed

By Allen Parker

COMPRESSION type refrigeration is accomplished by reducing the pressure in the coil to be refrigerated from a condensing pressure to an evaporating pressure. Consequently, there must be a dividing point in pressures and hence we have a low pressure and a high pressure in each job.

To maintain this differential in pressures appears to be relatively simple. It was originally attained in the first ice plants by the use of a simple hand valve with needle seat construction for sensitivity. But due to the ever changing temperatures of the coils being refrigerated, the hand valve required constant adjustment in order to obtain maximum efficiency.

The development of an automatic method of metering refrigerant made it possible to produce a domestic mechanical refrigerator, but the first two manufacturers of domestic refrigerators adopted contrasting methods of doing the job. One method was the automatic expansion valve which was far from perfect but did do a fairly good job. It was so designed as to hold a constant back pressure setting. This would be ideal if the load and temperature were always constant, but since this is true only on a very few applications, even the domestic job changes its characteristics from beginning to the end of the cycle.

Under this condition, it was necessary for a machine using an automatic expansion valve to always operate at the lowest pressure needed to reduce the temperature of the coil to the predetermined setting, thereby sacrificing the additional capacity at which the compressor would operate at the beginning of the cycle had the valve been able to adjust the pressure to the corresponding relative temperature. So you can see the automatic expansion valve was not suitable for all around use, although they are still in use today on jobs that require a constant temperature refrigerant throughout its load range.

During the same time that the automatic expansion valve was popular, the low side float was being used by another manufacturer, and it appeared to overcome many of the faults of the automatic expansion valve. It consisted of a refrigerator coil designed to operate flooded, and this was accomplished by using a needle valve on the high pressure liquid inlet which, in conjunction with a float ball on the low side, controlled the height of the liquid level in the coil or evaporator.

Replacing low-side float evaporator in a domestic refrigerator.

Undoubtedly, this type of coil produced the name commonly used by some service engineers in referring to cooling coils as evaporators. This type of coil, in my opinion, was most practical except for the fact that the float required a very delicate adjustment which caused a large volume of replacements due to the floats getting out of calibration.

The result of loss of calibration in the downward position was to permit too much oil to accumulate in the evaporator and retard or restrict refrigeration; while to be out of calibration in the upward position, would cause too much of the oil to return to the condensing unit and frost the suction line. Of course, if a low refrigerant charge caused a valve to stick open or to hang open a frosted suction line would result.

The older service men soon adopted the method of adding refrigerant to the low side float jobs when the suction line frosted and if that did not correct the difficulty then they would replace the valve. They seldom worried about an overcharge unless the over amount was enough to restrict the condensing area in the condensing unit. Consequently, the older service men soon considered themselves proficient in correcting the trouble on the low side.

High-Side Float System

With the first hermetically sealed refrigerating units came the high side float which operated a needle valve as on the low side float. However, the float itself was located in a chamber on the high side of the system and acted as a liquid receiver. The principle of operation is that the refrigerant condenses in the condenser coil and flows to the float chamber where it accumulates until the liquid level is high enough to raise the float and allow the refrigerant to flow to the evaporator. As the supply is exhausted, the valve closes and the operation is repeated.

The high side float system presents an entirely different set of characteristics from the low side type. For example, the charge of refrigerant is critical, and too large a charge causes a frosted suction line, while too small a

charge produces little, if any, refrigeration. This is just opposite from the low side float system.

An interesting feature of the high side float is that the needle valve seat is not considered the actual dividing point between the high and low side of the system, since in almost every case a small capillary tube connects the outlet of the float to the evaporator. The orifice size and length of this tubing also regulate the liquid as it flows to the evaporator.

Capillary Tube System

Some time ago, some of the manufacturers producing lower-priced units, put a machine on the market using only a capillary tube for the metering purpose. Although nearly everyone frowned and predicted failure, apparently it was successful, and this year the outstanding refrigerator manufacturers are divided, some using the high side float and others the capillary tube only. A comparison of the two will give the features of each.

Almost any type of evaporator could be made to operate on either of the systems and frequently service men attempt to change over the operation of an old model refrigerator to this newer type of refrigerant control. But I believe that in almost every case these changes are impractical except in those few instances in which the manufacturers furnish a conversion kit for this purpose, which of course makes it a properly engineered job, eliminating all experimenting to get proper operation.

The length of the capillary tube is important. The size of the orifice in the tubing is much too large to supply the small amount of refrigerant from an ordinary supply, but it is purposely made this large in order to eliminate as much as possible the plugging and restricting of it from carbon and other foreign residue that would ordinarily quickly plug a smaller orifice. In order to use this larger size bore in the capillary tube, it is necessary to add enough resistance to the line (that is to add enough length) so that the supply of refrigerant going to the evaporator will be sufficiently less than the capacity of the compressor, thus building a high pressure in the system and forcing the gas in the condenser to liquify before returning to the evaporator.

The size of the capillary tube, that is, the length and inside diameter, is determined by the size and capacity of the refrigerating

Checking heat exchanger on control tube of capillary tube job.

plant plus the type of refrigerant used. Domestic refrigerators most commonly use tubing 1/64 inch inside diameter with a length of from 20 to 40 inches. A unique feature of the capillary tube job is that they seldom use a liquid receiver. This is readily understood since there would be no need for it other than for pumping down purposes.

During normal operation, practically the entire refrigerant charge is held in the evaporator with no reserve in the high side. The greatest objection to having a receiver on the high side is the possibility of having refrigerant vaporize in it and pass on into the evaporator as a vapor. If for some reason it was found desirable to install a liquid receiver, the outlet must be at the absolute bottom, otherwise vaporization may take place at that point and cause condensation to form in the receiver and pass the warm heat load that the refrigerant has taken up on to the evaporator and possibly causing short cycling.

To get a correct charge of refrigerant in a capillary tube job, one must charge the system until the evaporator fills up and frosts over completely with the suction line frosting for two or three inches toward the compressor.

High side float jobs are sometimes mistaken for capillary tube systems. This is because many of them use a small bore tube similar to the capillary tube. However, it is larger, the inside diameter being probably ⅛ of an inch. This small size tube to a certain extent serves the same purpose as a capillary, that is, it adds resistance to the liquid supply line from the high side float to the evaporator, thereby maintaining a slight pressure on the low side of the needle seat and eliminating condensate from forming on that line.

Some of the older high side float jobs did not use the smaller tubing but used the regular ¼-inch liquid line from the float to the evaporator and at the evaporator there was installed a loaded check needle valve. This valve was so calibrated that the weight on the needle seat kept the valve closed until pressure from the high side float was raised above twenty-five pounds. One difficulty experienced with this loaded valve in the South was that during cold weather machines that were located in a cool place failed to refrigerate. The cause of the trouble was that the head pressure failed to go high enough to overcome the twenty-five pound pressure of the check valve and failed to supply liquid to the evaporator.

Several remedies have been offered to overcome this trouble, including the adding of a dry non-condensable gas to the system to raise the head pressure. But this necessitated another trip to the customer's home at the begining of the summer to remove this inert gas in order to secure more condensing area for the unit. The most successful method is to remove the check valve and disassemble it. Then using a file, cut a small flat place on the side of the needle seat. This will act as a small expansion orifice during light loads, and during the peak loads, the valve will operate normally.

Non-condensable gas (mostly air) accumulating in the high side float chamber (not in the condenser as previously mentioned) has probably been the greatest cause of high side float trouble. Some floats have a purge valve located at the top of the float chamber where it may be purged off. On others, it is necessary to remove the float from the machine in order to purge it.

A float with a leaky needle, or a float that hangs open, will allow the liquid refrigerant to continue to flow into the evaporator after

(Continued on page 64)

MOTOR Service

Connecting Diagrams for Lap Wound A-c Motors

Part 12

By A. C. Roe

Railway Motor Engineer
Westinghouse Electric & Mfg. Co.

WITH this article, we present the eight-pole, two- and three-phase diagrams arranged for dual voltage and equalizer connections. We also continue the discussion started last month regarding the making of stub connections. This month, we will show how to make stub connections when using coils that have the leads brought off the bottom.

Fig. 34 is the eight-pole, two-phase, two- and four-parallel diagram with eight leads brought out. The dotted lines on the small schematic sketch indicate how additional jumpers can be placed as equalizer jumpers. On a two-parallel connection, the leads L_5 and L_7, also L_6 and L_8, are connected together and they then become equalizer connectors. Thus for the two-parallel, dual-voltage diagram, only four equalizing jumpers are required instead of eight for the single-voltage diagram, Fig. 31, of last month's discussion.

The three-phase, eight-pole, two- and four-parallel star connecting diagram is shown in Fig. 35. This is arranged with nine leads for dual voltage, the dotted lines on the small schematic sketch showing where the equalizer jumpers should be placed. And as in Fig. 34, the leads L_4 and L_7, L_5 and L_8, and L_6 and L_9, when connected together for the two-parallel, star connection, form equalizer connections. Thus the connection shown in Fig. 35 requires only six equalizing jumpers, instead of nine that must be used with the three-lead, single-voltage, two-parallel connections described last month.

Fig. 36 shows the eight-pole,

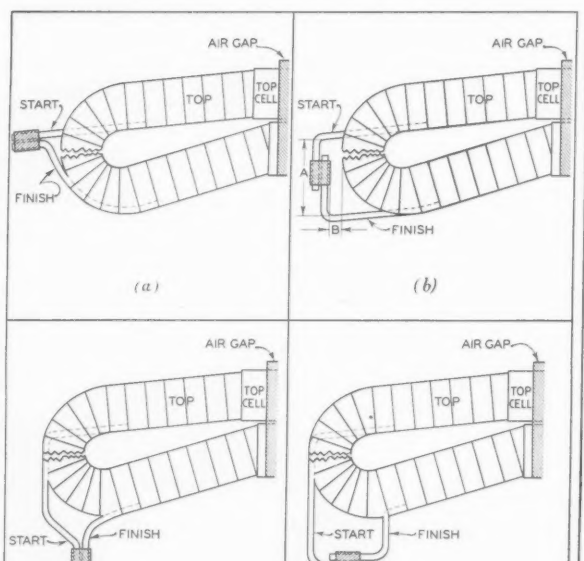


Fig. N. These diagrams show details of making stub connections for coils with leads on bottom. (a) This type connection is designated as a straight stub. Leads are on bottom, straight out, and may be free or fastened. (b) U-stub. Leads on bottom, bent down, and free or fastened. (c) Straight stub. Leads on bottom, bent down, and free or fastened. (d) U-stub. Leads on bottom, bent down, and free or fastened. The way the leads are brought out affects the making of stub joints.

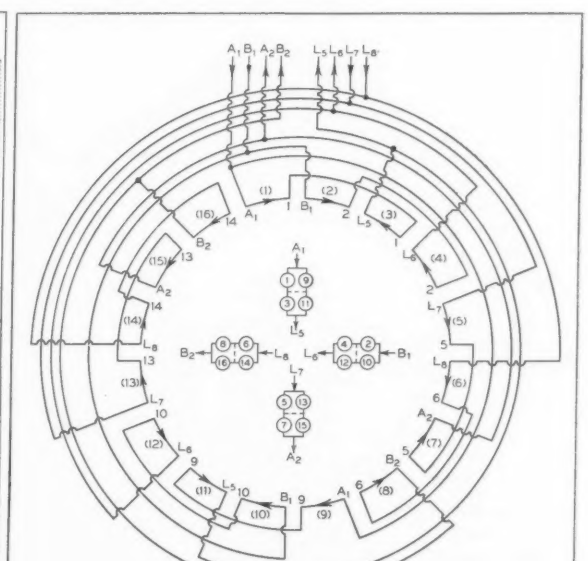


Fig. 34. Diagram for 8-pole, 2-phase with 8 leads for 2-parallel or 4-parallel connection. For 8 leads bring out A_1, A_2, L_5, and L_7 for A-phase; and B_1, B_2, L_6, and L_8 for B-phase. For 2-parallel connection, connect A_1 and A_2 to A-phase lines; connect B_1 and B_2 to B-phase lines; connect L_5 and L_7 together; and connect L_6 and L_8 together. For 4-parallel connection, connect A_1 and L_7 to A_1 line; connect A_2 and L_5 to A_2 line; connect B_1 and L_8 to B_1 line; and connect B_2 and L_6 to B_2 line. Note equalizing connections.

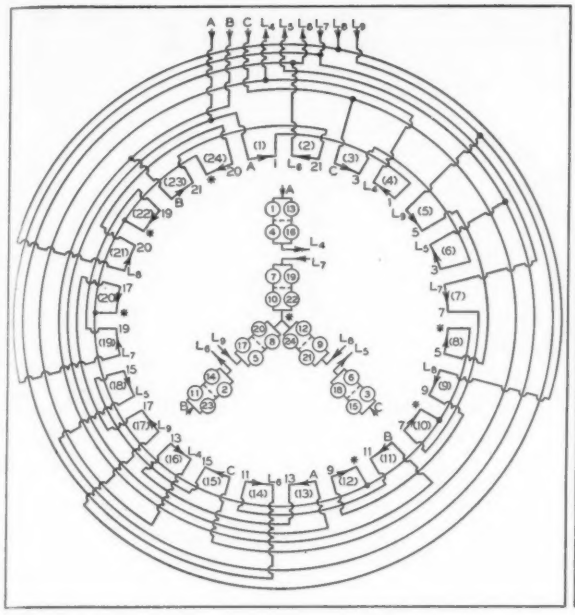


Fig. 35. Diagram for 8-pole, 3-phase with 9 leads for 2-parallel or 4-parallel star connection. Bring out 9 leads: A, L_4, and L_7 for A-phase; B, L_6, and L_9 for B-phase; and C, L_5, and L_8 for C-phase. For 2-parallel star connection, connect A, B, and C to lines; connect L_4 to L_7; connect L_5 to L_8; and connect L_6 to L_9. For 4-parallel star connection, connect A and L_7 to A-Line; connect C and L_8 to C-line; connect B and L_9 to B-Line; and connect L_4, L_5, and L_6 together. Dotted lines indicate equalizing connections.

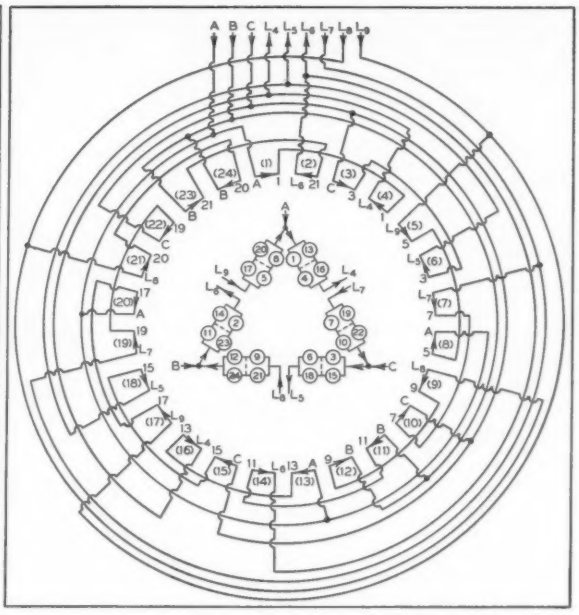


Fig. 36. Diagram for 8-pole, 3-phase with 9 leads for 2-parallel or 4-parallel delta connection. Bring out 9 leads: A, L_4, and L_7 for A-phase; C, L_5, and L_8 for C-phase; and B, L_6, and L_9 for B-phase. For 2-parallel delta connection, connect A, B, and C to lines; connect L_4 and L_7 together; connect L_5 and L_8 together; and connect L_6 and L_9 together. For 4-parallel delta connection, connect A, L_6, and L_7 to A-line; connect C, L_4, and L_8 to C-line; and connect B, L_5, and L_9 to B-line. Note equalizing connections.

three-phase, two- and four-parallel delta connection arranged for dual voltage with nine leads, and as in Fig. 35, the small schematic diagram shows the equalizer connection arrangement. As in the case of Fig. 35, this connection requires only six equalizing jumpers.

When any one of the two- or four-parallel diagram, Figs. 34, 35, or 36, are used as a four-parallel connection, the equalizer connection jumpers can also be used as shown in the schematic sketches, as each phase is divided into two separate groups as A_1 to L_5 and L_7 to A_2, Fig. 34, and each of these groups offer corrective action if provided with equalizer jumpers.

Fig. N, having four sections, illustrates how stub connections are made with coils that have the leads brought off from the bottom section of the coil. By comparing these sketches with those of last month's article, it will be noticed that by bringing the leads off the bottom, the starting or top lead is further away from the air gap, this distance being equal in all cases to the depth of a coil. Figs. N-a, N-b, N-c, and N-b of this and last month's article are directly comparable as each is alike except for leads being on top or bottom.

Fig. N-a shows a straight stub connection made with leads on bottom. Straight out leads can be free or fastened. By making a short connection, the stubs can be pushed in between the diamond points of adjacent coils.

Fig. N-b shows a U-stub connection made with the leads straight out, with leads either free or fastened. The height of the U as shown by "B" and the length, "A," can be varied to suit conditions.

Fig. N-c shows a straight down stub connection made with leads bent down, off the bottom, and with leads free or fastened. This method of making the stub connection places the joint away from the end bells and air gap and insures maximum clearance.

Fig. N-d shows a U-type stub connection made with the leads on bottom and bent down, and the leads can be free or fastened. This method also places the connection well away from the air gap and end bells, but in some cases it might interfere with the tie ring or other coil bracing items.

By comparing the figures in this article and those in the preceding three issues, one will obtain a clear understanding of the various methods that can be, and are used, to bring out the coil leads in lap wound stator windings. The methods shown in Figs. N-a to N-d this month are the ones used on the majority of lap wound a-c rotor windings, as it presents a smooth top surface on the end windings for the retaining steel wire bands.

The next article in this series will present the eight-pole, four-parallel, single-voltage diagrams and will include some data as to how to insulate stub and pole phase group jumpers.

●

THIS is the twelfth article in a series that will present 45 modern connecting diagrams for two- and three-phase lap wound induction motors for use on four-, six-, and eight-pole windings.

A master table of the 45 diagrams was presented in the July 1939 issue together with the first three diagrams of the series. Three additional diagrams have appeared in each succeeding issue.

NEWS of the INDUSTRY

Georgia Division Managers Elected Vice Presidents

All division managers of the Georgia Power Company were elected vice presidents at a meeting of the board of directors in Atlanta Tuesday, May 21. In addition, H. W. Boozer, general auditor of the company, was elected to the board of directors to fill a vacancy caused by the death of E. P. McBurney, of Atlanta.

Following are brief biographical sketches of the new vice presidents:

T. A. Gibson, Augusta division manager, is a native of Macon. A graduate of the Georgia School of Technology, class of 1914, Mr. Gibson worked with utilities in Missouri, Ohio and Alabama in engineering and managerial capacities before joining the Athens Railway and Electric Company as superintendent. He was Athens division superintendent and manager before coming to Augusta as manager of that division.

Jackson P. Dick, Atlanta division manager, has been connected with the company for 20 years. Joining the organization in 1920, he was made purchasing agent for the department of development, then general purchasing agent. In July, 1923, he was made assistant to the vice president and general manager, and later, Atlanta division manager. He is a graduate of the University of Georgia.

B. R. Chestney, Macon division manager, was born June 13, 1885, in Macon. He completed all of his preliminary schooling at Macon and then attended the Georgia School of Technology, where he graduated in 1908. For 10 months he worked as an engineer in Mexico and returned to Macon to work for a Macon utility, predecessor of the company. He has been connected with the electric utility industry ever since, successively holding the positions of transmission, maintenance and hydro plant engineer, chief engineer and assistant to the manager of the Central Georgia Transmission Company, and Macon division manager.

J. J. McDonough, manager of the Rome division, has been connected with the company for 13 years. A native of Savannah, he graduated from the Georgia School of Technology in 1923. For the next four years he was athletic coach of all sports for the Savannah High School. In 1927 he became assistant manager of the Southern Georgia Power Company. He was stationed in Athens, Brunswick, Dublin and Douglas before going to Augusta as commercial manager for the company in 1930. He was commercial manager until 1937, when he was transferred to Rome to be division manager.

L. M. Shadgett, Athens division manager, has held that position for the past three years and has been connected with the company for the past 12 years. Previous to his present position, Mr. Shadgett was superintendent of wholesale operations for almost 10 years. Before that he was connected with the Alabama Power Company as an engineer and as operating superintendent.

T. S. Sloan, Columbus division manager, becomes vice president after 32 years of service with the company. Before coming to Columbus in 1937 to fill his present position, he was for nine years manager of the Rome division. He also has had engineering and managerial experience with the company and its predecessors in Atlanta and Macon. A native of Anderson, S. C., he is a graduate of the secondary schools of Atlanta and the Georgia School of Technology.

Increasing Interest in Modern Kitchen Program

Increasing interest in the program and promotional materials of the Modern Kitchen Bureau is indicated by reports just released by the Bureau on operations for the past three years.

Roger Bolin, chairman of the advertising committee of the NEMA Electric Refrigerator Section, has just released figures showing that 78 utilities purchased 45,896 promotional items from the Modern Kitchen Bureau during the first four months of 1940, whereas only 18 utilities bought 19,699 items during the entire year of 1938. In 1939, 47 utilities cooperated with the bureau's promotional plan.

According to Arthur Grove, chairman of the advertising committee of the NEMA Electric Range Section, the Modern Kitchen Bureau sold 466,256 promotional items to 172 utilities during the period January 1 to April 24, 1940.

These figures are practically double those of three years ago, when large scale activities were first inaugurated by the Bureau. In the first six months of 1938, 85 utilities bought 254,620 promotional items. In the first four months of 1939, 130 utilities purchased 380,321 items.

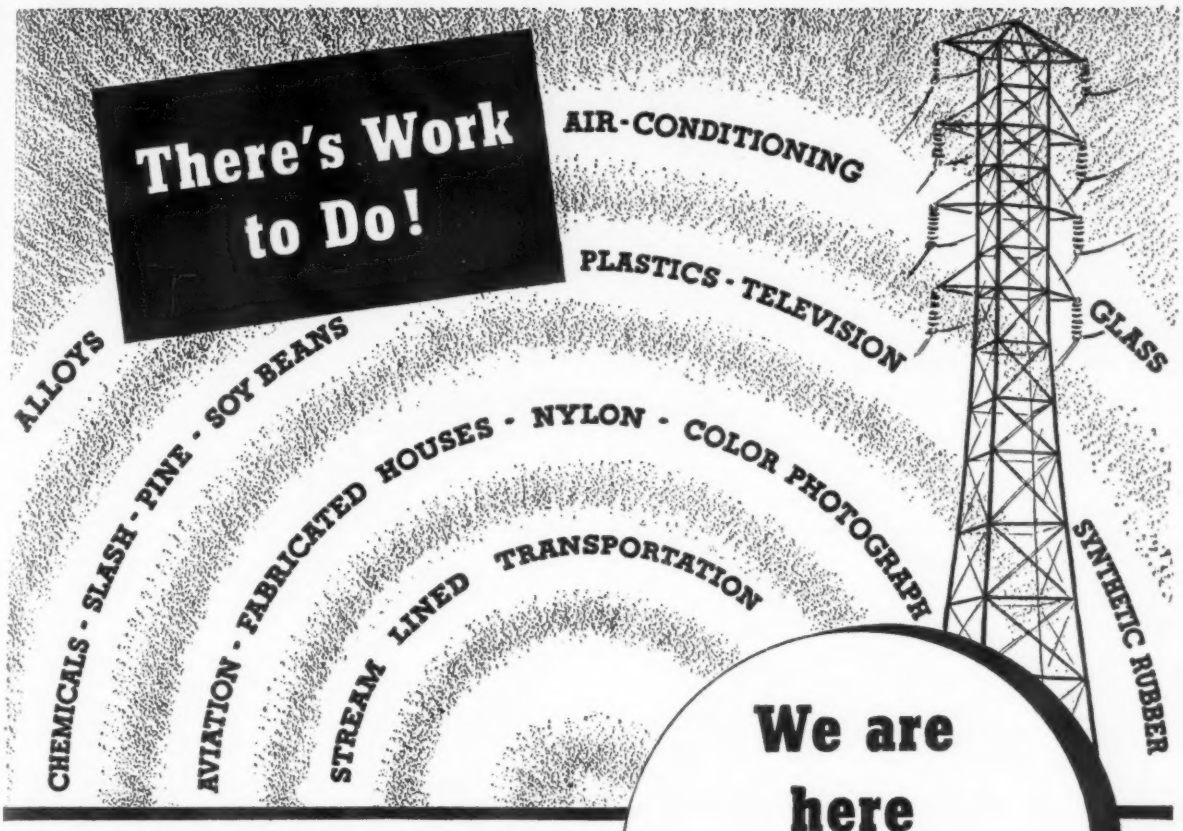
August Jaeger, chairman of the advertising committee, NEMA Electric Water Heater Section, the Modern Kitchen Bureau, announces that in the period January 1 to April 30, 1940, 127 utilities purchased 203,538 promotional items for use in their own local activities. This is almost ten times the 13 utilities who used similar material in the entire year of 1938 and almost one hundred times the total number of 284 pieces they purchased during that year. During the entire year of 1939, 108 utilities bought 56,391 items.

Newest publication of the Bureau is an unusual selling manual entitled "A Pattern for the Profitable Promotion of Electric Roasters." This manual has been prepared for the benefit of utilities interested in building greater load through this popular appliance.

The forepart of the book contains detailed reports from eight widely scattered utilities who conducted intensive electric roaster promotions during 1939. There are detailed reports of each operation, together with actual figures on the number of homes served by each utility, the number of active dealers participating in the promotion, the electric range saturation of the territory and the 1938 and 1939 electric roaster sales figures.

The latter part of the book develops a pattern to be followed by other utilities who seek to duplicate the success of the eight cited.

B. R. Chestney | J. P. Dick | T. A. Gibson | J. J. McDonough | L. M. Shadgett | T. S. Sloan



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THERE'S work to do. Jobs to be had. Jobs to be made. Wages to be paid. There's better living to be created . . . more industrial development . . . public progress.

The nation is never "done"; human needs are never satisfied; the level of progress is never static.

New products — new materials — new uses —new fields. Reconstruction—obsolescence—replacements—expansion. These are more than "words". Every one stands for elements that mean action, opportunity and national building up . . . and back of them, business and industrial enterprise, resource, research and capacity to make them so. It means work and wages.

THE COMPANIES in this system maintain for the benefit of their customers a personnel of experienced power, heating and lighting engineers . . . for cooperation in all matters looking to improving customers' operations through use of the companies' services.

Communications and inquiries covering the system territory may be addressed to—Industrial Development Dept., The Commonwealth & Southern Corporation, 20 Pine Street, New York.

Words? What about the industrial and employment future in such words as these? . . . plastics, alloys, slash-pine, "coal-salt-air-and water." Or these words . . . air-conditioning, steel and glass houses, aviation, television, chemicals, electricity. New vistas these and new raw material developments on the national horizon.

As a cooperating factor in industrial and employment progress—this company's industrial and engineering facilities are available to industries in matters related to application and use of the system's light, heat and power services in the operating territories.

There's work to be done. Our job is to work with you in present or proposed activities.

The Commonwealth & Southern Corporation

MICHIGAN - ILLINOIS - INDIANA - OHIO - PENNSYLVANIA - ALABAMA - GEORGIA - FLORIDA - MISSISSIPPI - SOUTH CAROLINA

Motor Shop Men Meet in Detroit

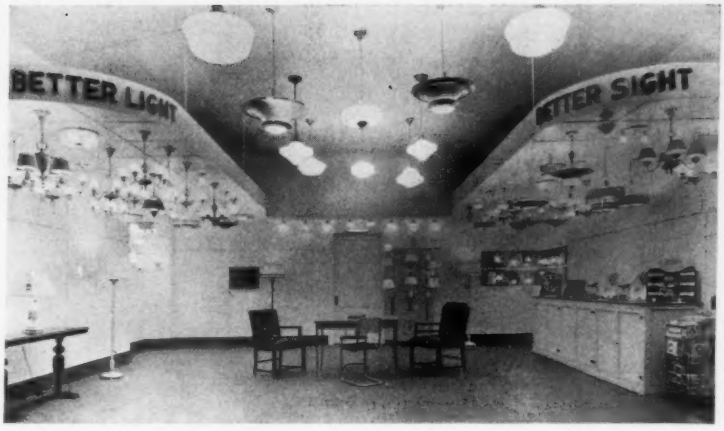
Termed biggest and best was the seventh annual convention of the National Industrial Service Association held in Detroit at the Book-Cadillac Hotel, April 22-24. More than 220 members and guests from 28 states were in attendance. Of particular interest was the fact that more shop men than usual were in attendance at this convention and participated fully in the discussions.

C. A. Sievert, of Sievert Electric Company, Inc., Chicago, was elected president for the coming year. Other officers elected included L. Bonnecaze, Jr., Best Electric Company, Inc., New Orleans, vice president; Charles J. Cannon, A. H. Nimmo Electric Company, Detroit, secretary; and Alfred L. Brown, Alfred L. Brown Associates, Inc., Worcester, Mass., treasurer. Stewart N. Clarkson serves as executive secretary with headquarters in New York City.

A wide range of activities and subjects were covered in the papers presented during the business sessions of the convention.

Southerners were well represented on the program with P. M. Potter, Potter and Rayfield, Inc., Atlanta, presenting two papers, entitled "Results Obtained by Shop Modernization" and "New Shop Equipment." J. H. Nelson, Tennessee Armature and Electric Company, Knoxville, discussed "Our Experience with High Temperature Wedges." H. E. Grant, Tennessee Electric Motor Service, Nashville, Tenn., contributed an interesting discussion on "Fractional Horsepower Motor Repairing."

Other topics covered in the addresses included "National Certification Board Plans and Progress," "Keys to Efficiency in Shop Operation," "Pricing Carbon Brushes Cut in the Service Shop," "A Time Study of Motor Repair Prices," and "Building Volume Through the Sale of Accessories."



Sales come easier in this unusually well-arranged display room of the Fort Sumter Electric Co., wholesale distributors of lighting equipment and appliances, in Charleston, S. C.

St. Pete Appliance Dealers Form New Organization

Major appliance dealers in St. Petersburg organized as the Associated Electrical Dealers on April 6 for the purpose of coordinating their activities for the greater benefits of all members.

First project to be undertaken by the new association will be a six weeks promotional activity on electric refrigeration which opens this week.

Modern Kitchen Bureau's non-product promotional aids will be furnished by Florida Power Corp., in support of the objectives of this coordinated group.

Officers elected last week to head the Associated Electrical Dealers are Wm. F. Davenport, president; Alex Brinson, vice president; Joe Hibbs, secretary and R. J. Knipe, treasurer. Fifteen St. Petersburg dealer firms are members of the new association.

These adequate wiring leaders gathered in Charlotte, N. C., recently to map a program to give home owners more electrical comforts and conveniences. They are, seated left to right: R. H. Bouligny, chairman; A. E. Schanuel of New York, field representative of the National Adequate Wiring Bureau; Norman E. Tindal, secretary of the Charlotte Bureau. Standing, left to right: Charles B. Miller, Jr., utility representative; J. R. Smith, vice-chairman; J. C. Bolen, treasurer; J. V. Sapp, electrical contractors representative. Mr. Miller and Mr. Sapp are shown holding half-page advertisements used by the Charlotte Adequate Wiring Bureau.

Virginia Chapter, I.A.E.I. Holds Annual Meeting

J. M. Murphy, electrical inspector at Roanoke, Va., was elected president of the Virginia Chapter, I.A.E.I., at the Chapter's fifth annual meeting held at the Hotel Roanoke, April 29 and 30. Mr. Murphy succeeds F. P. Sagendorf, electrical inspector of Fairfax, Va. Other officers elected included C. H. Dougherty, superintendent of the electric plant at Franklin, Va., vice president; and G. M. Miller, electrical inspector of Richmond, secretary-treasurer. Ninety-four members and guests of the chapter were registered at the meeting.

Dr. Morton G. Lloyd, president of the International Association, addressed the group, discussing some of the pressing executive and administrative problems of the I.A.E.I. with specific emphasis on financial matters, revision of rules on representation on the executive council, working of the publicity committee in its endeavor to have

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Where to Use G-E MANUAL STARTERS

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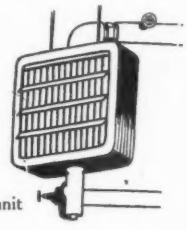
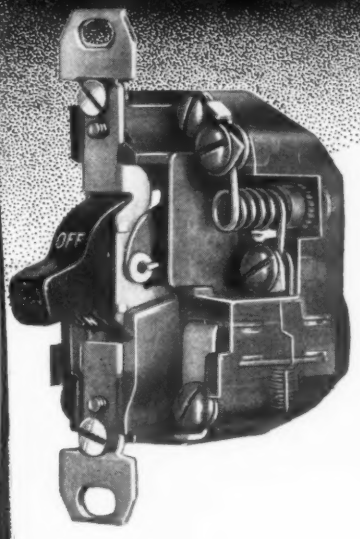
Small-hp machines or grinders



Ventilating fans or unit heaters

Coolant pumps

Job presses, bindery equipment, etc.



CR1061 for Motors to ¾ Hp

Switch element, removed from case, suitable for fitting into standard deep switch box.

Overload heater, selected to suit motor to be protected, easily installed on switch.

Solder-film-type overload device protects motor against serious overheating.

Trip-free mechanism cannot be held closed during excessive overload.

Simple quick-make, quick-break, snap-action toggle mechanism assures maximum contact life.

Arcing chamber encloses long-lived, double-break, fine-silver contacts—minimizes arcing and provides high interrupting capacity.

Large terminal screws facilitate making good connection.

CR1062 for Motors to 7½ Hp

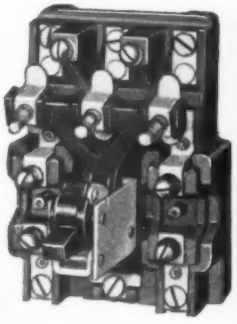
This switch element removed from its enclosure is typical of manual starters rated 7½ hp at 440 volts.

Convenient terminals at top and bottom for line and load connection.

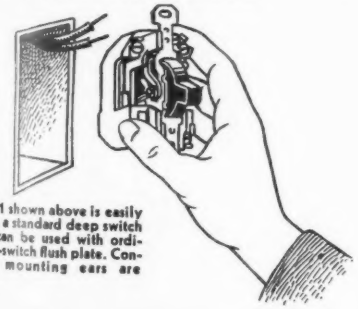
Fine-silver contacts, separated by arc barriers, provide high interrupting capacity and long life.

Operated by sturdy handle of molded Textolite.

Thermal overload device protects motor against serious overheating. Replaceable heater is selected to suit motor.



INSTALLATION NOTE



CR1061 shown above is easily mounted in a standard deep switch box and can be used with ordinary single-switch flush plate. Conventional mounting ears are provided.

Fortify yourself against "call-backs" due to starter or motor trouble by using G-E starters. They are so widely accepted that they're sure to please your customers. And they're easy to install, too—will save you time on the job.

There is a G-E distributor near you with a complete stock of these manual starters—and the entire line of G-E control. General Electric, Schenectady, N. Y.

GENERAL ELECTRIC

676-6

the Post Office Department recognize progress in electrical safety by an issue of stamps, and need for study of the advisability of having separate and simplified rules for rural communities.

C. S. Whitaker, president, Southern Section, I.A.E.I., also addressed the meeting, outlining extra activities required of inspectors, the increasing complexities of the daily routine, and a further need for standardization of methods, materials and equipment.

A well balanced program occupied the inspectors for the full two days of the meeting. Among others who addressed them were W. W. Krebs, Appalachian Power Company; G. A. Sawin, of N.E.M.A.; N. E. Cannady, Raleigh; Victor H. Tousley, international secretary, I.A.E.I.; Professor Claudius Lee, Virginia Polytechnic Institute; R. B. Shepard, Underwriters Laboratories, Inc.; Samuel J. Rosch, Anaconda Wire and Cable Company; Howard H. Weber, U. S. Rubber Company; A. Penn Denton, Rigid Conduit Association; O. K. Coleman, American Gas and Electric Company; Joseph Whitner, Southeastern Underwriters Association; E. J. Shafer, General Electric Company; F. J. McJames, Crouse-Hinds Company; Arthur L. Abbott, N.E.M.A.; C. C. Coon, Dowdy Electric Company; and A. B. Hines, of General Electric Company.

Dealer-Utility Clinic Studies Business Health

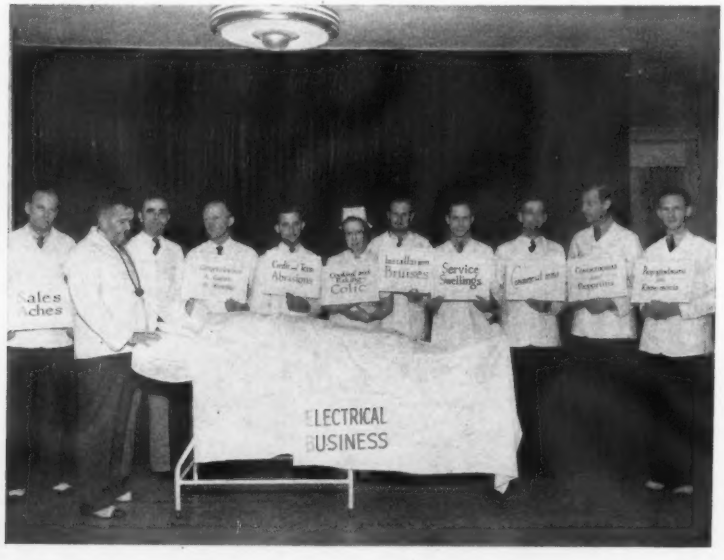
Developed as an original suggestion by one of the commercial men of Florida Power Corporation, a Dealer-Utility Clinic was presented during February to contact employees of the company and to local cooperating dealers. Purpose of the clinic was to reveal, through discussion of various phases of new business and service operations, the most effective use of power company aid in the promotion of electrical business (retail selling of equipment).

The patient was bandaged from head to foot. The chief surgeon introduced each "doctor" who presented a special phase of the electrical business. At the close of each talk, the chief surgeon removed the bandage supposedly relating to the ailment cured by the "doctor's" talk. Each doctor gave a three-minute talk and at the close of the last talk, the patient was entirely revived and got up from the operating table.

Chief Surgeon E. B. Brant, originator of the skit, is shown at the head of the patient. The "medical" staff from left to right: D. B. Hyer, Jr., "Sales Aches"; A. J. Keesler, "Gasitis"; Walter Collany, "Winditis"; William Howell, "Credit and Term Abrasions"; Nurse Ruth V. Carlington, "Cooking and Baking Colic"; George Schraudt, "Installation Bruises"; Ralph Schroeder, "Service Swellings"; Gordon Kent, "Commercialzema"; C. W. Ailstock, "Contactnomia and Reportitis" and J. M. Robertson, "Propagandamania."

These topics gave the company an opportunity to tell about its plans and purposes in an entertaining and effective manner.

R. H. Giedd, new business manager of Florida Power Corporation, presided at the meeting of employees and utilized the skit as a means of telling the contact employees about the objectives of new business and how they would be obtained.



Paul Ramsey, for many years southeastern representative of Arrow, Hart & Hegeman Company, has established an electrical jobbing business in Chattanooga, Tenn. Associated with Mr. Ramsey in the new firm is Arthur Stokes. The Chattanooga business will be known as Stokes-Ramsey Electric Company. Arthur Stokes owns the Stokes Electric Company, of Knoxville, Tenn. This photo was taken just after the official opening in April when the company entertained the Chattanooga Electricians Club. From left to right are J. L. Quinn, F. C. Alford, Jr., and Paul Ramsey, all of Stokes-Ramsey company. Barron Glenn, manufacturers' representative, and C. M. Richardson, Cutler-Hammer, Inc.

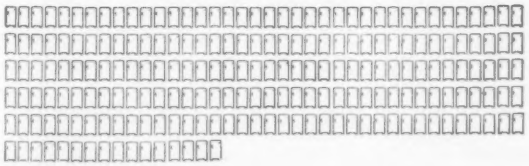
Shelby Branch in Jackson

On June 1 the Shelby Electric Company of Memphis, Tenn., will open a branch in Jackson, Miss. The nature of the business will be the same as it is in Memphis, where the company operates under the slogan "Electricians for the South." The firm handles electrical machinery, repairs, engineering and contracting.

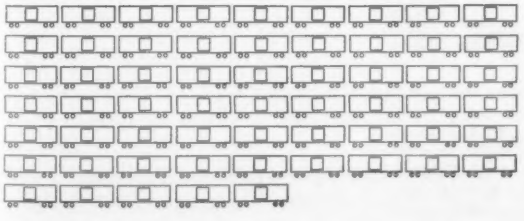
WORLD'S LARGEST REFRIGERATOR FACTORY PRODUCING AT FASTEST PACE IN HISTORY

A NEW FRIGIDAIRE
Every 17½ Seconds

206 FRIGIDAIRES *Per Hour*



59 CARLOADS *Per Day*



Glance at your watch . . .

Before the second hand makes one revolution, more than three new Frigidaire Refrigerators come off the assembly line! 206 per hour!

Frigidaire dealers and salesmen are making sales history. And to meet their unprecedented demands for more and more products, Frigidaire is breaking every production record!

An average of 59 *carloads* of Frigidaire products leave the plant every working day!

What better proof that the world's largest refrigerator factory is geared to the needs of its selling organization!

FRIGIDAIRE DIVISION
General Motors Sales Corporation, Dayton, Ohio

IT IS FRIGIDAIRE FOR '40!

Revision Planned for Wiring Design Handbook

The Industry Committee on Interior Wiring Design, which is responsible for keeping the nationally accepted Handbook of Interior Wiring Design up to date, contemplates a complete revision of the book during the current year. The revision will take into account advances in wiring design practice since 1937, as well as the changes made necessary in basic design considerations due to the important revisions forthcoming in the 1940 edition of the National Electrical Code.

The work will be handled by a technical subcommittee of which R. G. Slauer, Westinghouse Electric and Manufacturing Company, New York City, is chairman. Other subcommittee members are: A. B. Smith, National Electrical Manufacturers Assn., Allan Coggeshall, Hatzel and Buehler, M. S. McNaught, electrical contractor, G. S. Merrill, General Electric Company, F. N. M. Squires, N. Y. Board of Fire Underwriters, Howard Stevenson, Detroit Edison Company, and W. S. Stewman, New York Power and Light Corporation. Mr. Slauer will appreciate suggestions, comments and criticisms regarding the Handbook text, material covered and method of presentation from anyone interested.

Henley Heads Birmingham Electrical Association

Ed Henley, president of Birmingham Battery Company, Norge distributors, was chosen chairman of the Electrical Association of Birmingham at the annual meeting April 25. He succeeds D. B. Clayton, official of the Knight Electric Company.

Succeeding Mr. Henley to the vice chairmanship of the group is L. S. Hart, sales promotion manager of Moore-Handley Hardware Company. M. B. Hinman, supervisor of the Dealer Coordination Division of the Birmingham Electric Company, was elected secretary-treasurer.

New Wholesale Company Opens in North Carolina

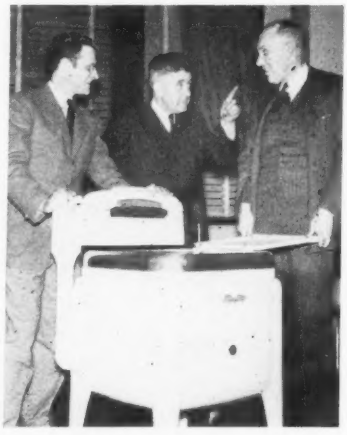
Standard Electric and Supply Co., is the name of a new electrical wholesale business recently established in Burlington, North Carolina, at 208 W. Front Street. Organized by D. D. Watson, who has been actively associated with the electrical wholesale industry for nearly twenty-five years, the company will do an exclusive wholesale business, selling only to licensed electrical contractors.

Southern Electric Supply Company, is the name of a new electrical wholesale firm recently opened in Durham, N. C., by A. Marius Clegg. Shown in the photo, from left to right, are Mr. Clegg and L. W. Brasington who will be in charge of stock and purchases. Mr. Clegg is a native of Durham but has lived in Greensboro for the past several years where he was connected with the Electric Supply and Equipment Company.

Dealer Coordinators Appointed By Arkansas Power and Light

Recent changes in the sales personnel of the Arkansas Power and Light Company include the appointment of seven dealer coordinators, one for each division, whose duties will be to assist the dealers of their respective divisions in increasing their sales volume and profits on electrical appliances. These men will call on every active dealer in their division at least once each month offering constructive sales suggestions and any other assistance possible. They are all successful salesmen with many years' experience and their assistance in securing and training salesmen and dealers will be of definite value in reducing personnel turn-over and increasing sales and profits.

Those appointed are Paul F. Denson, Fred H. Phillips, Clarence E. Jones, A. P. Mitchell, Harry W. Hoffman, E. J. Van Meter, and Carl E. Vickery.



Maytag washing machine dealers in the Winston-Salem district, gathered in April at the Robert E. Lee Hotel to hear C. B. Mason, right, eastern branch manager, of Philadelphia, and E. B. Ogan, left, district manager, of Charlotte, map the spring sales campaign. Lester Tucker, district manager, of Greensboro, center, had a thing or two to point out himself when this picture was snapped. Six cities within the 40-mile radius of the Winston-Salem trading area were represented at the dinner meeting.

Kentucky Inspectors To Meet in June

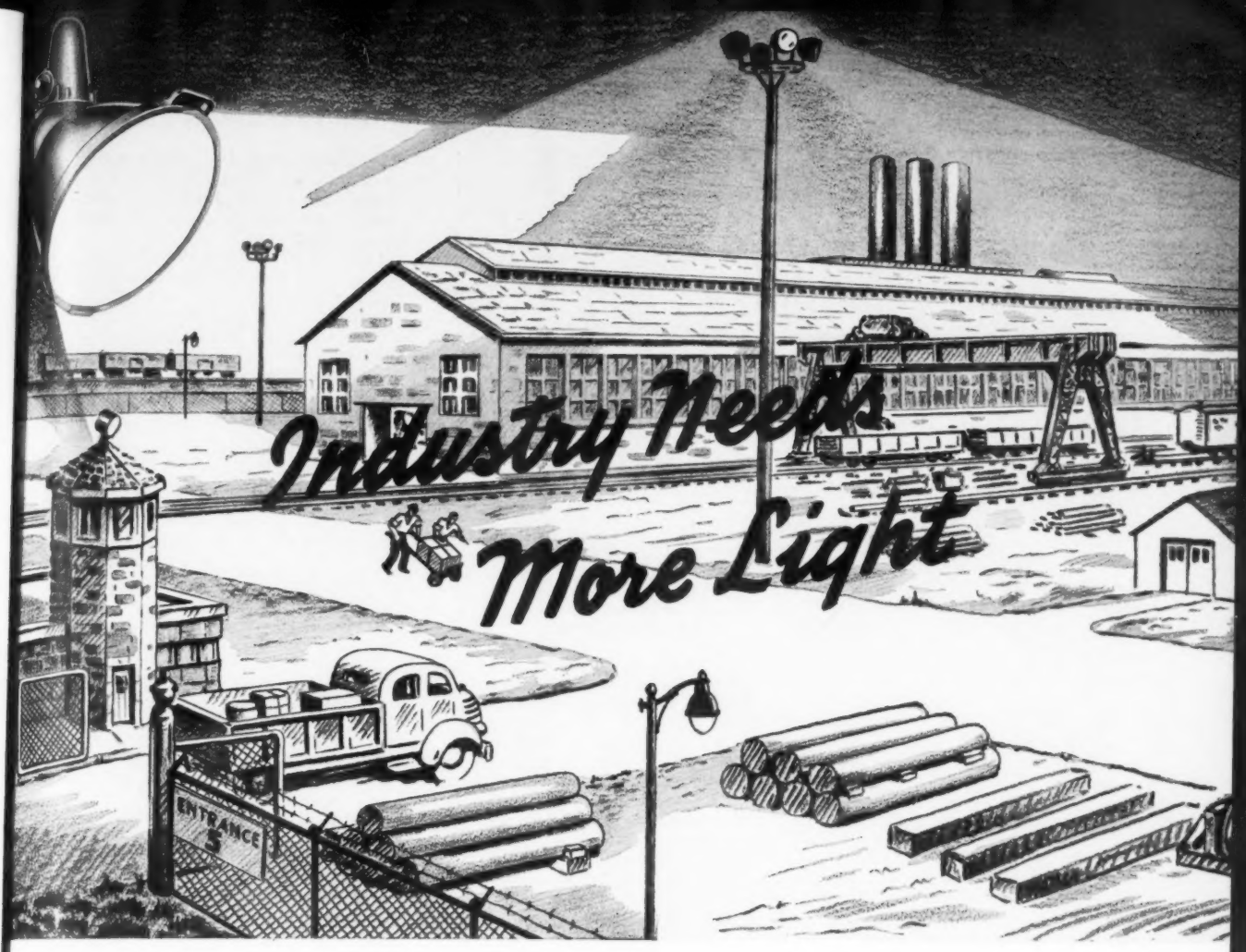
The annual meeting of the Kentucky Chapter, International Association of Electrical Inspectors, will be held at Hotel Irvin Cobb, Paducah, Ky., June 27 and 28. Further details may be obtained from the secretary, Victor Knadler, 300 South 41st Street, Louisville, Ky.

New Hotpoint Distributor

Among several new distributors for Hotpoint home appliances recently announced by R. W. Turnbull, vice president, Edison General Electric Appliance Company, Inc., is the Graybar Electric Company, Inc., which will handle wholesale distribution of Hotpoint products in the Jackson, Mississippi, area, directing operations from their headquarters at 601 South Peters Street, New Orleans.

Easy Appoints Tri-State Philco Company Distributor

J. J. Nance, general sales manager of Easy Washing Machine Corporation, has announced the appointment of the Tri-State Philco Company of Huntington, West Virginia, as Easy distributor in the Huntington-Charleston area.



HERE'S YOUR OPPORTUNITY

THOUSANDS of industrial plants are again on guard to prevent malicious destruction and espionage. While many companies are taking precautions to keep their factories free from trouble, others have postponed protective measures. Now is a good time to talk G-E protective lighting—floodlighting to protect their plants, to save their time and money.

The G-E distributor or sales office nearest you can supply the equipment you need. If you would like suggestions about a lighting plan for a difficult job, any one of our many lighting specialists will be glad to help you. Or write to General Electric, Schenectady, N. Y.

Thousands of factories need more light inside, too — to improve all-round efficiency and accuracy, speed production, and assure safety.

FOR YEAR-AFTER-YEAR NIGHT-TIME PROTECTION

G-E low-priced spun-aluminum floodlights have a high efficiency that compares favorably with the more expensive copper-bronze or cast-aluminum floodlights. Several beam angles from 28 to 100 degrees and a variety of mounting attachments make these floodlights suitable for most floodlighting applications.

FOR LIGHTING FENCE OR PROPERTY LINE

The Form 79 luminaire is admirably suited for lighting fence or property lines because of its light-distribution pattern. Deflectors within the globe, or glass refractors, redirect a large portion of the light along and within the fence line. The stepped reflector makes possible the use of 500-watt multiple lamps.

GENERAL ELECTRIC

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MANUFACTURERS' News

$500,000 Expansion for Refrigerator Production

Plans for a half-million dollar expansion program at the Mansfield plant of the Westinghouse Electric and Manufacturing Company is announced by L. E. Osborne, manager of manufacturing and engineering of the Westinghouse Merchandising Division.

Work will start within a month on the expansion program, which will increase the Mansfield plant's capacity in production of household refrigerators by one-third, Mr. Osborne said. Cost of the program, including buildings and equipment, will be somewhat in excess of $500,000.

Principal project is to be construction of a new metal stamping building, 70 feet by 360 feet, and three stories high. This will be located beside the present vitreous enameling plant of the Mansfield works, and will fabricate metal parts for refrigerators. These parts will be porcelain enameled in the vitreous plant and carried to the assembly lines in the main Mansfield plant building by conveyor in the 1220-foot overhead bridge which will be completed shortly.

Price Reduction Announced For Many Mazda Lamps

Sweeping price reductions, averaging approximately 17 per cent and affecting more than one hundred types and sizes of Mazda lamps, were announced recently by both General Electric Lamp Department and the Westinghouse Lamp Division.

Of particular interest to the users of household types are 7½, 15 and 25-watt Mazda lamps now listed at 10 cents each. Lowest price of a home-type Mazda lamp heretofore has been 15 cents. Other popular household Mazda lamps substantially reduced are the standard inside-frosted 40, 50 and 60-watt sizes, each having been reduced from 15 cents to 13 cents.

Fluorescent and mercury type lamps have also been reduced in price as well as several specialty types such as aviation, movie projection, and electric sign lamps. Representative reductions on fluorescent lamps are indicated by the following reductions on daylight and white lamps: 15-watt T-8, reduced from $1.15 to 95 cents; 20-watt T-12, reduced from $1.65 to $1.25; 30-watt T-8, reduced from $1.50 to $1.25; and 40-watt T-12, reduced from $2.30 to $1.90.

Aerial Demonstrators Help Dealers Sell Up

Most effective is Philco's One-minute Aerial Demonstrator as a sales aid, according to announcement by C. E. Gerhard, manager of Philco Parts Sales.

"Selling up from table models to console radios has been simplified for many dealers by use of this device," Gerhard stated. "This simple demonstration is more convincing than a thousand words from the most capable salesman."

The Philco demonstrator is contained in a little black box which can be held in the palm of a salesman's hand. By pressing a button on the box a terrific amount of static and interference is generated. The customer is then asked to turn the Philco Super Loop Aerial himself and thereby eliminate the static and interference completely.

Only four inches square and powered by a small self-contained battery, the demonstrator needs no connection to either radio or electrical outlet. Vibrator and miniature loop produce directional radiation of static impulses, causing a thunderous roar in the radio.

Record Advertising Program Planned by Norge

Coincident with a sharp step-up in factory production, the Norge Division Borg-Warner Corporation is scheduling for early release a national newspaper advertising program of record size.

The program, according to James A. Sterling, general merchandise manager for Norge, will involve a series of dominating advertisements in 164 major cities throughout the United States, in addition to full color pages in metropolitan supplements and space in approximately 2,900 country and small town newspapers.

This, he says, is by far the most intensive advertising effort that the company has ever undertaken. Total daily circulation of the newspapers in which the advertisements will appear exceeds 22,000,000. The ad drive will concentrate upon Norge's most important home accessory product, the Norge Rollator electric refrigerator.

A clever and colorful selling aid, which is proving popular with Hotpoint range retailers, is the Sales Pointer. Printed in two colors, on heavy cardboard, its plastic binding allows the Sales Pointer to lie flat on the right-hand work surface of 1940 Hotpoint electric ranges. Each page points out, and graphically describes, a different Hotpoint electric range feature, illustrating all the advantages that the feature offers.

We Can Help You Do Your Buying

ELECTRICAL SOUTH WILL GLADLY HELP YOU DO YOUR BUYING . . . TELL US WHAT YOU WANT AND WE CAN SAVE YOU TIME AND POSTAGE

The manufacturers who advertise their products in ELECTRICAL SOUTH are obviously making a special and direct effort to secure southern business. These manufacturers, in nearly every case, have representatives located throughout the South and have distribution facilities to give the southern trade prompt and efficient service.

Look over the items advertised and described in this issue of ELECTRICAL SOUTH and if you will tell us the ones in which you are interested, we shall be glad to have manufacturers send you further information about them.

You will find listed on the back of this page the firms whose goods are advertised. A number is placed immediately preceding each name. On the post card below are shown corresponding numbers. All you have to do is to circle or check the numbers on the card that correspond with the numbers which precede the names listed on back of this page. Mail the card to us. It requires no postage. We will gladly forward your name to the manufacturers indicated by the numbers checked and ask them to send you additional information.

No Postage Required . . .

THIS CARD IS FOR YOUR CONVENIENCE

See Names of Manufacturers On Back of This Page

Postage Will Be Paid By W.R.C. Smith Pub. Co.

No Postage Stamp Necessary If Mailed in the United States

BUSINESS REPLY CARD

FIRST CLASS PERMIT NO. 582, SEC. 510, P. L. & R., ATLANTA, GA.

ELECTRICAL SOUTH
1020 GRANT BLDG.
ATLANTA, GA.

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3	Aluminum Co. of America	6
4	American Coolair Corp.	61 and 67
5	American Steel & Wire Co.	*
6	Anaconda Wire & Cable Co.	10
7	Asplundh Tree Expert Co.	60
8	Automatic Electric Heater Co., Inc.	65
9	Automatic Electric Mfg. Co.	63
10	Autovent Fan & Blower Co.	63
11	Carpenter Mfg. Co.	63
12	Columbia Steel Co.	*
13	Commonwealth & Southern Corp.	45
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24	General Electric Co., (Floodlights)	51
25	General Electric Co., (Lamps)	*
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72	Westinghouse Elec. & Mfg. Co., (Ranges)	*
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76	Wiremold Company	*
77	Youngstown Sheet & Tube Co.	*

CHECK OR CIRCLE NUMBERS—SIGN—MAIL

June, 1940

Electrical South, Grant Bldg., Atlanta, Ga.

Gentlemen: I am interested in the advertisements of the firms checked. Please forward my name to manufacturers or nearest representative or jobber.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51
52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68
69	70	71	72	73	74	75	76	77								

Name _____ Title _____

Company _____

Address _____

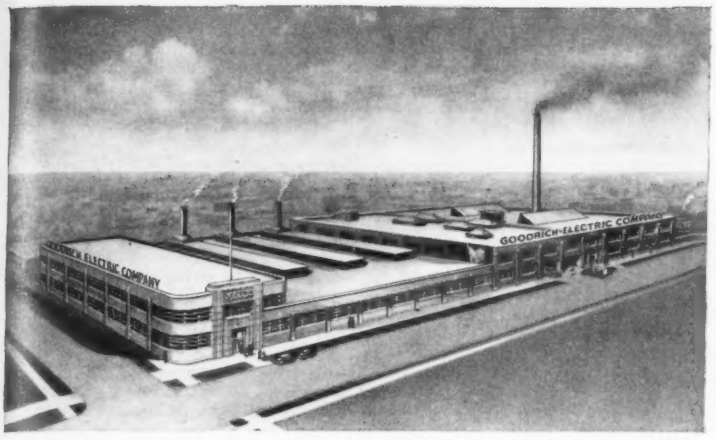
City _____ State _____

Readers' Service

No Postage Required

Often our readers would like to secure additional information on certain lines advertised in the paper but do not have the time to write for it.

Use This Card



Goodrich Electric Company Soon to Occupy New Plant

The Goodrich Electric Company of Chicago, manufacturers of porcelain enameled lighting fixtures for industrial use, reports the near completion of their new plant, located on the northwest side of Chicago. The plant, which will have 146,000 square feet of floor space, will be ready for occupancy in July or August.

It will be one of the largest and most modern porcelain enameling plants in the country and one of the very few devoted exclusively to the manufacture of lighting equipment. Among many of its interesting manufacturing features are two electric enameling furnaces of the largest and latest design, which will be in operation 24 hours a day.

Bendix Announces Low-Price Washer Models

A new Bendix product to be known as the Utility Model Home Laundry is announced by Bendix Home Appliances, Inc., South Bend, Indiana. The new model, which is almost identical in appearance with the Standard Model introduced in 1939, is of the same capacity as the Standard or the original DeLuxe model which was brought out in 1937.

According to the manufacturer, the new Utility model washes, rinses and damp-dries in exactly the same manner as the higher priced models and with equal efficiency; the chief difference between the lower priced machine and its predecessors being that the latter are fully automatic whereas the operator, manually, sets the control dial on the Utility model for the various washing, rinsing and damp-drying cycles.

In presenting the new models and the plans for merchandising it at recent meetings of distributors and dealers in various cities, J. S. Sayre, vice president in charge of sales, said: "The new Utility model in no way conflicts with the Standard and DeLuxe models from a competitive standpoint as the fully automatic features of both the latter and the beautiful cabinet enclosure of the DeLuxe fully justify the price differentials.

"In 1938, with only the DeLuxe model, our company—according to Washington Machine Association figures, sold nearly 50% of all washing machines in the over $100 price classification. In 1939, with two models, Standard and DeLuxe, we sold over 50% of all washers sold in the over $100 price classification.

"With the addition of the Utility model at the sensationally low price of $99.50, we feel reasonably confident that we can obtain a large percentage of the sales in the below $100 price brackets without in any way disturbing our market for higher priced models."

Through advertising and sales promotion manager Parker H. Ericksen, the company announces that an extensive campaign in trade papers to acquaint dealers and salesmen with the new product has been launched. This will be followed by a large campaign in national magazines and metropolitan newspapers. In addition, dealers will be given cooperative support.

J. S. Sayre P. H. Ericksen

National Electric Products Moves into New Offices

J. M. Moore, divisional sales manager for National Electric Products Corporation, Atlanta, reports that the southern district offices of the company are being removed from the Healey Building where they have been located since 1916, to 188 Walton Street, Atlanta, where the company recently established a large warehouse stock of all National products to better serve their wholesale distributors in the South.

At the same time, Mr. Moore announced the establishment of a new sample department so that samples of all National products may be made available immediately to architects, engineers, and others interested. Heretofore it has been necessary to obtain such samples from the factory.

News About People—

Bruce A. Fleming, for the last six years an executive secretary of the National Electrical Manufacturers Association, has resigned to become assistant to the president of the Edwin L. Wiegand Company, Pittsburgh, Pa., manufacturer of Chromalox heating units for electric ranges and industrial uses.

Bruce E. Fleming

Since his graduation from the University of Kansas and World War Naval service, Mr. Fleming has been active in sales promotion and in instalment financing relating to appliance sales. He has served as branch manager for The Timken Roller Bearing Company, vice president of the General Contracts Purchase Corp., and came to NEMA from the Merchandise Department of the General Electric Company at Bridgeport, Conn.

At NEMA he has directed the recent national promotional campaigns on electric ranges, water heaters and refrigerators and has been active in other executive affairs.

Eugene Vinet, an electrical engineer well known in the utility field and for the last ten years with the Edison General Electric Appliance Co., Inc., Chicago, takes over Mr. Fleming's work in NEMA.

Fred W. Holz, Jr., formerly secretary of the Commercial Electric Cooking Council, of Edison Electric Institute, has become associated with the Reddy Kilowatt program, according to Ashton B. Collins, creator of Reddy Kilowatt. Mr. Holz has been connected with the electrical industry for a number of years, first with the old National Electric Light Association, and then the Edison Electric Institute. He served first in the engineering department and for the past several years in the commercial department directly under C. E. Greenwood, commercial director. Mr. Holz will make his headquarters in the Graybar Building, New York City.

In his new connection, Mr. Holz will be occupied with the expansion of the Reddy Kilowatt program which now serves some 128 companies in forty-four states, serving nearly 8,000,000 customers.

* * *

A. B. Chance, founder of the A. B. Chance Co., Centralia, Mo., was recently elected chairman of the board. His son, **F. G. Chance,** succeeds him as president and general manager. At the same time, it was announced that Mr. Chance has appointed **N. A. Toalson,** vice president, **J. T. Isbell,** vice president in charge of sales, and **O. E. Walker,** vice president in charge of production.

* * *

Herbert W. Clough has been elected vice president in charge of sales of the Belden Manufacturing Company, according to an announcement by **Whipple Jacobs,** president. Mr. Clough has been with the Belden organization since April 1922 with experience in both the production division and sales department.

* * *

According to announcement by **J. M. Moore,** divisional sales manager, **J. H. Dyer,** of Atlanta, has been appointed manager of the Atlanta territory of the southern district of National Electric Products Corporation, Pittsburgh, his territory will comprise all of Georgia and parts of Kentucky and Tennessee.

Mr. Dyer was formerly field representative of the National Electrical Contractors Association. He is well known in this territory, having traveled this section extensively and made friends in all branches of the electrical industry.

Announcement was also made of the appointment of **Walter R. Kelley** as manager of the Birmingham territory where a new branch office has been established at 1112 Martin Building. Mr. Kelley's territory will include northern Alabama and Mississippi and western Tennessee, except Memphis.

J. H. Dyer

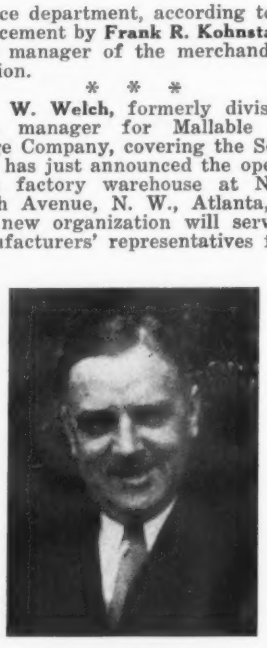
* * *

George E. Wagner, former laundry equipment regional supervisor for Westinghouse Electric and Manufacturing Company, has been named manager of the new vacuum cleaner section recently created in the appliance department, according to announcement by **Frank R. Kohnstamm,** sales manager of the merchandising division.

George E. Wagner

* * *

E. W. Welch, formerly divisional sales manager for Mallable Iron Range Company, covering the Southeast, has just announced the opening of a factory warehouse at No. 8 North Avenue, N. W., Atlanta, Ga. The new organization will serve as manufacturers' representatives for a wide range of automotive supplies and major electrical appliances.



E. W. Welch

Associated with Mr. Welch in the new company will be **W. H. Welch, Don Lanning, L. B. Buckman,** and **B. Leo Wilson.**

* * *

Frank P. Fischer, 1820 Audubon Street, New Orleans, La., has been appointed representative for the A. E. Uptegraff Manufacturing Company, Scottdale, Pa., for the state of Mississippi.

Increased business and industrial activity in the South has made necessary the removal of the Cutler-Hammer office and warehouse in Atlanta, Ga., to a new location at 134 Marietta St., N. W. The Atlanta office is in charge of **A. C. Gibson.**

* * *

Walter F. Nelson, formerly of the firm of Smith and Nelson, has bought the interest of **J. W. Smith** in the firm and hereafter Mr. Nelson will conduct the business as an individual under his own name at 413 Bona Allen Building, Atlanta. The company serves as manufacturers' representatives for several electrical manufacturing firms.

* * *

Huie-Simmer Company, 103 Thomas Building, Dallas, Texas, has been appointed district sales representative for the Trico Fuse Mfg. Co., Milwaukee, in the state of Oklahoma.

* * *

The appointment of **Berrien Moore** as manager of the Florida district with headquarters at Tampa, has just been announced by **Walter Geist,** vice president of the Allis-Chalmers Mfg. Company. Mr. Moore has been with Allis-Chalmers since 1908 when he joined the company as a hydraulic sales and textile engineer. He spent considerable time in that capacity in North and South Carolina and in 1917 he was appointed manager of the Atlanta district, continuing in that position until his present appointment.

* * *

D. R. Churchman, formerly in the Columbus, Ohio, territory of the Fostoria Pressed Steel Corporation, has been made southeastern district manager for the company, making his headquarters at Atlanta, Ga. His initial work in the southeastern territory will be the displaying of the company's para-sphere reflectors and brackets in connection with the drying lamps utilizing infra-red rays.

New Electrical Products

New Kelvinator Range

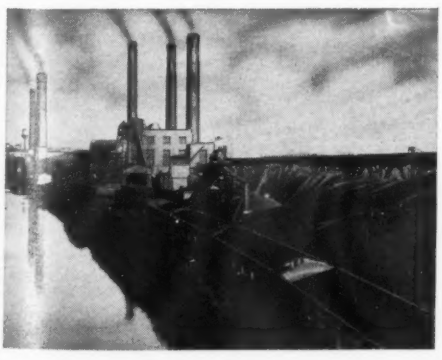
A new model electric range which will be added to the 1940 line of Kelvinator ranges has just been announced. Designated as Model ER-28, the new range will carry a suggested delivered-in-the-kitchen price of $129.95 anywhere east of the

AN INVITATION TO INDUSTRY

THE VIRGINIA Electric and Power Company recently completed another large addition to its steam power station in Richmond, Va.—the second such addition in the last three years.

This station is one of the major steam stations on the Vepco Electric System serving the Tidewater area of Virginia, where favorable climatic conditions and economic factors are attracting the locations of many new industries, and the relocation of others.

New industries, or industries already established but seeking more favorable locations for their plants, are invited to make a study of this area of Tidewater Virginia, and the many advantages it has to offer. Inquiries addressed to us, or to the Virginia State Chamber of Commerce will have prompt attention.



A view of the 12th Street Power Station of the Virginia Electric and Power Company in Richmond, Va., showing the addition recently completed.

The Electric Transmission System of the Virginia Electric and Power Company, comprising 2 large steam stations, 7 hydro stations, and 5 interconnections with neighboring utility companies, serves approximately 160,000 customers in nearly 500 cities, towns, and communities with an ample supply of dependable electric power.

VIRGINIA ELECTRIC AND POWER COMPANY

Rocky Mountains. The new range is of one-piece welded steel construction, porcelain-enameled inside and out with a one-piece cooking top of acid-resisting porcelain enamel with back splash and back shelves. The new oversize, two-unit oven, found throughout the entire Kelvinator line, is also a feature of this model. The range is equipped with 5-Speed Chromalox surface units and a full six-quart Scotch kettle.

At the same time it was announced that $20 price reductions had been made on two other models in the line originally priced at $119.95 and $139.95, bringing them down to $99.95 and $119.95.

Convertible Hand Cleaner

A new vacuum cleaner designated as the "Floor Cruiser" and described as two models in one because it may be used either as floor cleaner or a hand cleaner has been introduced by the Westinghouse Electric and Manufacturing Company. The new cleaner is being offered for all light cleaning in homes and apartments. It is

a motor driven brush type model and has a light but strong Micarta body. It weighs only five pounds when used as a hand cleaner and is easily converted into a floor model by inserting it into an exclusive tubular steel frame. Suggested list price of the cleaner is $18.95, complete with the steel frame for converting it into a floor cleaner.

New Nesco Roaster

National Enameling and Stamping Co., Milwaukee, Wis., introduces a new line of electric roasters for 1940. Foremost in the new 6 model line that includes a model and capacity for every requirement and purse, is the Nesco No. 9145 DeLuxe Automatic electric roaster. This 20 quart capacity roaster is equipped with a built-in time clock for absolute automatic cooking. It is exceptionally easy to operate—all the housewife has to do is to set the clock for the time she wants the roaster to start cooking and for the hour she wants it to stop.

Heretofore any kind of a timing device has been an accessory—inconvenient to use because it was separate from the roaster, and more or less unsatisfactory because of complicated operation. The new Nesco time clock is built into the front panel of the roaster—it is always there when the housewife wants to use it.

This new DeLuxe Nesco roaster has numerous other quality features in addition to the built-in time clock. It has a Dial Cover Raising Control that makes it easy to raise or lower the cover, or keep it in one position if desired. Likewise, there is a special Dial Browning Vent on the cover, marked for all kinds of cooking.

New Universal Range

Landers, Frary & Clark, New Britian, Conn., have just announced a new special priced leader model range designated as the Meteor. This Universal range has an oven that is larger than heretofore and is the fastest electric range built by Universal, reaching 400 degrees Fahrenheit between six and seven minutes. Redesigning the oven units has also given them much more equalized heat for baking. The Universal Magic Eye oven control lights up when the oven is on and automatically switches from preheat to bake when the predetermined oven temperature is first reached. The Universal Selectatrol makes it possible to use the timer control for operation of either the oven or convenience outlet. Surface units of this range include three Universal Super-Heat units having 5 heats, one 8½ inch in diameter, and two 6¼ inch. Also included is a 660 watt economy cooker.

Air Conditioner Starter

A new automatic starting timer for Philco-York portable air conditioning unit has just been made available by Philco Radio & Television Corporation, Philadelphia. This device now makes possible the starting of the air conditioning unit at any exact hour desired so that a bedroom or office will be perfectly air conditioned at any specified time it may be wanted for use. The unit is easily and simply installed, being wired in series with the electric power supply to the air conditioner.

New Apex Ironer

Two new features have been incorporated in the new Apex ironer, Model 518-C. One of these features is the use of adjustable bimetalic disc type thermostats. The thermostats, two of them located at either end of the shoe afford more positive control of the heat in the ironer and are an added safety feature.

The other feature is the introduction of two speeds to the floating roll. A fast speed is provided for the normal ironing and a slow speed is for the convenience of the beginners and makes learning the operation of the ironer a simple matter.

Other features of the ironer are: the drop back type, white vitreous porcelain table top, folding end shelf at either end of the ironer, dual switches for shoe heat and motor, a safety control, red light signal when heat is on, and conveniently located controls operated by knee or finger

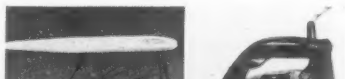
Cory Filter Rod Display

The sale of Cory glass filter rods is being stimulated by an attractive new counter display. Standing only 14 inches high, it serves as an eye-catching poster of glittering blue and orange on silver foil. An actual Cory glass filter rod is shown, fitting into a full size picture of a glass coffee

maker. This highly practical display is offered free with orders of 12 or 24 of the filter rods. The pocket of the display holds three of the orange and blue Cory glass filter rod cartons, and the balance are concealed behind the card. The entire display is designed for self-selling. The price of 50 cents is prominently displayed, and the story of how the rod works and full instructions are printed on each carton which the shopper can pick up from the display and inspect.

Ironing Board Combination

An innovation in home ironing accessories in the form of a new all-metal ironing board is being introduced by the appliance and merchandising department of the General Electric Co., Bridgeport, in combination with a newly-designed "dial-the-



fabric" type of electric iron. The iron has a regular list price of $8.95 and the "Met-L-Top" ironing board lists at $5.95, but the two will be offered in combination for the present for $9.95 plus the buyer's old iron.

Design features of the new iron, which weighs 4½ pounds, include a cool moulded handle and thumb-rest, a heel stand to save lifting, a compensating thermostat, and chrome-plate finish.

Frigidaire Low-Priced Range

A new low priced standard household electric range with a suggested retail selling price of $99.75 in Zone A, has been added to its range line by Frigidaire Division, General Motors

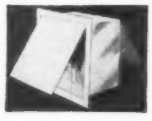
Sales Corporation. The new model includes all basic construction features of other standard and deluxe models. Among features of the new B-10-40 model are a full size twin-unit oven, high speed broiler, regular speed-heat units with five heats, Thermizer cooker, one-piece stainless porcelain cabinet, one-piece stainless porcelain working top, silver contact switches and armored wiring. The B-10-40 is a base type range and its price of $99.75 is $20 less than the suggested retail selling price of the B-15-40 which previously had been the lowest priced household base type model in the company's line.

New Low Priced Fan

The Scatter Breeze, a 12-inch non-oscillating fan newly developed by Victor Electric Products, Inc., Cincinnati, is offered as an efficient low priced model. The patented Victor Breeze Spreader designed as an integral part of the fan enables the Scatter Breeze to deliver a steady, cool breeze over a large area. The fan gives a uniform movement of air at the rate of 900 cubic feet per minute developed at 1540 rpm. It is beautifully finished in light gray with Silchrome blades with suggested retail price of $12.95.

Remote Control Kitchen Fan

A new development in kitchen ventilation is announced by the Autovent Fan and Blower Company, Chicago, Ill., in their new remote control kitchen fan. The automatic feature of operation makes possible installation in any desired location. By pushing the conveniently located switch,

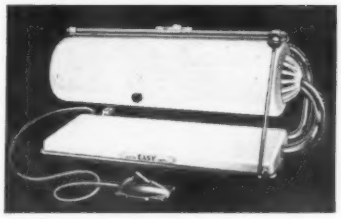


the special door-operating motor goes into action, opening inside and outside doors and at the same time fan motor starts. The fan comes in one standard size and is constructed with an adjustable wall sleeve, making it adaptable to any wall thickness. Wall sleeve and outside door is finished in rust-resisting aluminum. Inside door and frame are enameled white to go with any color combination. When the fan is turned off, motor operated doors silently close, protecting the fan from rain, snow or dust accumulation.

New Easy Ironer Line

Highlight of the new line of 1940 Easy ironers recently announced is the Easy Porta-Matic, the first Easy portable to enter the ironer field. The Porta-matic will retail at $39.95. Also included in the line are four all-white table-top model ironers designed for step up selling.

The Easy Porta-matic is priced to include many special features. The ironer, which weighs only 32 pounds,



has two ironing speeds and a 3-way heat control. Its 1200-watt shoe-element gives it great heat recovery ratio.

Other features include hand or foot controlled roll stop for pressing, automatic cord rewind reel, fabric heat guide, Torque Tube pressure principle that gives uniform pressure over entire shoe area. Carrying handle makes transportation easy and allows ironer to be hung on closet hook for storage.

Featured in the Easy Cabinet ironer line is the model 140—a stylish table-top ironer with 3 speeds, 3 heats, adjustable knee control, foot controlled roll stop, clothes rack and many other features.

New G-E Vacuum Cleaners

Three new floor vacuum cleaners of the motor-driven brush type, and one new tank-type cleaner, have been announced by the General Electric appliance and merchandise department, Bridgeport, in line with a previously stated decision to produce fewer models than in the past. Least expensive of the three floor cleaners is the new "Special" Model AVF-15. It has a 1/5-hp G-E motor for either alternating or direct-current operation, built-in fan cooling system, foot-operated tilting device, over-sized rubber bumper, and a close weave cleaner bag of 675 square inches in size. Suggested list price is $29.95.

Expected to be the most popular model in the line is the "Moderne" Model AVF-18. This model is equipped with a headlight and carries a suggested list price of $39.95. Top model in the floor cleaner line is the "De Luxe" Model which is priced at $54.50.

"Inch-Marked" Metallic Tubing

An electrical metallic tubing that is "Inch-Marked" to make electrical installation easier, more accurate, and more economical has just been announced by Steel and Tubes Division, Republic Steel Corporation, Cleveland, Ohio, manufacturers of Electrunite Steeltubes. Every length of "Inch-Marked" Electrunite Steeltubes has a continuous foot-rule clearly printed in blue ink right on the tube. The awkward task of holding a rule against the tube to measure the required distance is thus eliminated. In many instances, the tube itself may be used as the foot rule but in other cases it may be necessary to

measure the space with a rule, after which it is only necessary to count off the feet and inches as marked on the tube.

The new markings together with a new Electrunite bender just announced will greatly simplify bending operations, the manufacturer reports.

New Fluorescent Units

The latest addition to the Hygrade line of Miralumes, complete fluorescent lighting units, is the C-101, a 100-watt unit designed for general commercial illumination, employing two 40-watt Hygrade fluorescent lamps in either daylight or white. In this new unit, manufactured by Hygrade Sylvania Corporation, Salem, Mass., the lamps and chassis are housed in sand-blasted, glass-paneled shade, triangular in cross-sectional shape. This shielding, together with the unique arrangement of the two lamps, means that some light is directed downward and to the sides for direct illumination, while the rest is directed upward for semi-indirect lighting.

Like all models in the Miralume Line, the C-101 comes completely assembled and wired, complete with lamps, ready to install. Starters are easily accessible, and unit has been corrected for both power factor and stroboscopic effect.

Combination Type Connectors

A new connector which may be used either as a solderless connector or as a solder lug has just been introduced by the Square D Company, Detroit, Mich. Each connector covers a wide range of wire sizes which may be required for the device with which it is used and has only two parts, a

cast lug and a special set screw. The lugs are designed to hold solder and to function as solder lugs if desired. All lugs have been listed with the Underwriters' Laboratories for wire sizes from No. 10 to 1,000,000 CM.

New Low Priced Floodlight

For general use in business, industry, on the farm and in the home, the Westinghouse Electric & Manufacturing Company has announced the addition of two new lightweight, weatherproof and low priced universal floodlights to their A-8 and A-10 lines. These new floodlights employ one piece reflectors to which is attached an extruded aluminum socket housing, thus providing a sturdy rigid construction. The lens is held in place by a metal retainer ring and the assembly is mounted on a cast aluminum mounting bracket allowing horizontal adjustment through 360 degrees and vertical adjustment

through 135 degrees. The new A-8 fixture is 8 inches in diameter and employs 100 watt lamp while the new A-10 is 10 inches in diameter and uses a 200 watt lamp.

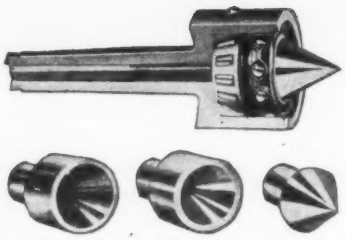
Type MB Multi-Breaker

A change in the case construction used with Type MB multi-breaker assemblies has been announced by Cutler-Hammer, Inc., of Milwaukee. The device now has an insulated groundable neutral combining the construction of the insulated and grounded neutral types. The insertion of a screw in a tapped hole of the insulated neutral bar grounds the neutral and the case. This new construction is primarily an aid to electrical wholesalers and contractors, eliminating the need of carrying more than one type of device in stock. The contractor need not be concerned with the problem of which type of neutral construction is required until installation is made.

Live Center for Lathe

The Ideal Live Center, manufactured by Ideal Commutator Dresser Co., Sycamore, Ill., is a new low-cost tool for use on lathes, millers, grinders, hand screw machines, etc., that cuts production costs wherever this type of equipment is in use.

The center rotates with work on the highest obtainable precision ball and taper roller bearings. It permits heavier loads at higher speeds, saves



man-hours in centering work, saves cost of fast-wearing dead centers.

With the Ideal Live Center three pieces or inserts are available. These include a male insert for work already centered, plain female insert for uncentered work, and female insert with three raised lands for uncentered work having a flat or burred keyway.

Plug-In Relays Available

A complete line of relays with plug-in construction has been announced by Westinghouse Electric and Manufacturing Company. This new construction makes it possible to remove the completely assembled relay in its case from the switchboard to a more convenient or better equipped location for testing, inspection, or adjustment.

The terminals of each relay extends from the rear as bayonet fingers which engage with the spring-clip receptacles as the relay is pushed into position. A relay can be removed by loosening two screws extending through the glass cover. The plug-in contacts are so designed that removing the relay from its switchboard position does not disturb any of the circuits to which it is connected. False operation of circuit breakers or open-circuiting a current transformer are prevented by contacts which operate automatically when the relay is removed.

New "Streamlined" Climbers

Using a new design which eliminates the use of any unnecessary metal without any sacrifice of the safety factor, Mathias Klein & Sons, Chicago, Ill., announces a new "Streamlined" linemen's light weight climber.

The new climber (No. 1939) is forged from special bar steel, heat

treated for maximum toughness and strength. Tests prove it as reliable as the previous models which were 50% heavier.

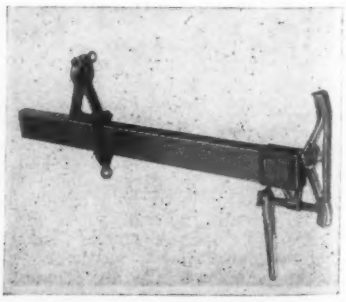
The new model is equipped with a special ankle strap ring which permits easy removal of an old strap and attachment of a new one. The ring makes the crossing of the straps unnecessary and, hence, increases comfort of the user. Gaff's are individually tempered; they are particularly suited for climbing hard and treated poles.

Bus Support and Connectors

A complete line of electrical connectors and bus supports for square tubular bus, both ventilated and unventilated types, is announced by Burndy Engineering Co., Inc., New York, N. Y. In these new connectors, clamping pressure is exerted on the corners of the tube thus preventing buckling of the tube walls. Drawings and prices are available for connectors to join cable, round tubing, flat bar or other conductor forms to square tubing.

Strain Carrier Device

A new strain carrier device which has been designed to use in removing and replacing defective insulators on power line dead ends, is announced by the A. B. Chance Co., Centralia, Mo. While similar in design to one that was released about six months



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TREE EXPERT COMPANY
Economical Line Clearing

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CHICAGO, ILLINOIS
RANDOLPH 7773

BINGHAMTON, N. Y.
BINGHAMTON 4-5314

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ADAMS 5432

ALEXANDRIA, VA.
ALEXANDRIA 3581

LINE clearance by craftsmen who understand the simple philosophy of tree trimming which underlies the technique.

Let ASPLUNDH tree men act as your auxiliary troops in the everlasting campaign for continuous transmission and distribution.

Write today for informative booklet "Line Clearing"

HOMEFOLKS . . . with $15.22 a minute . . . spendable income

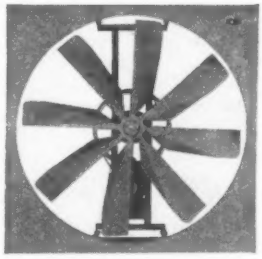
More than $8,000,000 has been paid to employes of the Georgia Power Company during the past twelve months — a big and busy sum to enliven Georgia channels of trade. That means that every minute of every day of every month in the year, $15.22 is added to the state's spendable individual incomes — put in the hands of this Company's employes located throughout the state, homefolks in the communities we serve, Georgians with their hearts and futures wrapped up in the welfare of Georgia, conscious that their own progress and prosperity and that of their Company is indivisibly bound up with the progress and prosperity of their state.

GEORGIA POWER COMPANY

12 YEARS of ENGINEERING LEADERSHIP

means NO KICKBACKS—GREATER PROFITS QUIETER, MORE EFFICIENT PERFORMANCE

with Coolair TRADE MARK ATTIC FANS



Swarming into the attic fan field, buzzing like flies about the honey-pot of profits, are scores of cheap, inefficient fans, all clamoring for the attention of dealers and consumers.

Don't be confused by this bedlam. If you want liberal profits and long-lasting customer goodwill, sell Coolair, the complete line of home and commercial exhaust fans backed by more than 12 years of engineering leadership. No other attic fan can offer you all of these Quality Points that help sell fans, protect your profits against costly trouble calls and make every buyer a booster:

1. Patented built-in springs that eliminate vibration noise.
2. Oversize ball bearings in fan hub for lifetime service.
3. Eight large blades—lower tip speed, quieter air flow.
4. Light, compact steel construction throughout—no cheap materials to warp, twist or tear loose.
5. Certified air ratings, according to ASHVE Test Code.
6. Right size fan for every home or commercial job—8 inches to 9 feet in diameter, up to 150,000 cfm.
7. Five-year guarantee on residence fans, backed by pioneer manufacturer in home-cooling field.

Fan-selling weather is *here!* Write today for this FREE CATALOG and details on Coolair's complete program of sales promotion. Start selling the Coolair line now and profit!

WRITE FOR THIS FREE CATALOG

Send the whole Coolair profit story to:

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Coolair Ventilating and COOLING Systems

AMERICAN COOLAIR CORPORATION

Manufacturers . . . . JACKSONVILLE, FLORIDA

ago for use on 8-inch insulators, this new design is for 10-inch insulators and may also be used with 8-inch insulators. The tool has a ratchet wrench built into it for use in taking up slack on strain insulators. The point on the arm at the right of the picture digs into the back of poles or crossarms and the socket arrangement at the left fits over the insulator clevis. By operating the ratchet wrench handle, the slack may be taken up to enable the operator to disconnect insulator strings and replace them without interrupting service. An eye screw on the bracket at left makes it possible to lift the strain carrier into place by use of an ordinary disconnect stick or similar hot line tool.

New BX Armor Cutter

No more nicked wires, no more bending of cable, no more fussing, no more shorts, and no more wasted BX are the advantages claimed for a new BX Armor Cutter announced by the Ideal Commutator Dresser Co., Sycamore, Illinois.

The tool is handy pocket size and easy to use. The jaws are formed to take BX cable of any make, two or three wire No. 12 or No. 14.

This cutter cuts quickly and cleanly without injury to wire insulation. Cuts anywhere along length of cable for opening into outlets, switch boxes, etc. Hardened steel cutting blade is removable for sharpening. Weight, complete, only 12 ounces. No adjustments are necessary.

Electrical Industry Business Trends

(*Continued from page* 13)

while sales of ironers in the country as a whole were practically unchanged in the first quarter from the same period of 1939, totaling 32,604 units, sales in 16 southern states totaled approximately 3,325, an increase of 13% over 1939.

Sales of refrigerators in 16 southern states for first quarter were well above same period of 1939, totaling 187,256, an increase of 34.5% over the 139,249 sold in first quarter of 1939. National refrigerator sales for first quarter totaled 813,880, an increase of 33%.

If it's a
CORY
REG. U.S. PAT. OFF.
COFFEE BREWER

IT'S COMPLETE!

● No other glass coffee maker matches the CORY in patented and exclusive features. Included in the price are:

1—Streamline Design—"wide neck"
2—Beautiful platinum Striping
3—Usable hinged Decanter Cover
4—"Safety Stand" Funnel Holder
5—Easy-grip, never-hot Handle
6—2-tablespoon Coffee Measure
7—"Fast-Flo" Filter (with most models)
8—CORY Glass Filter ROD (all models)
9—Formed Pouring Lip (no spatter)
10—Heat-resisting Glass by CORNING
11—2-heat Electric units (Hi-Low)

Each CORY Coffee Brewer is individually packed with all accessories needed for operation, convenience, smartness.

Delicious CORY brewed ICED Coffee and Tea are untouched by metal

CORY-*brewed* means *just right* . . . the real delicious coffee and tea flavor, without bitterness. Only 3 sizes to carry: small stock, big profits. WRITE for *new catalog* today.

Sensational
CORY GLASS FILTER ROD!
FREE with all CORY brewers. Fits most glass coffee makers. Hundreds of thousands in use.

GLASS COFFEE BREWER CORP.
325 NO. WELLS ST., CHICAGO, ILL.

Advertising Stressed At Arkansas Meeting

(*Continued from page* 35)

and Light Company, Pine Bluff, had charge of the Electric Section. Speakers and their subjects for this meeting were: "Radio Interference—Causes and Remedies," L. V. Blake, radio technician, Arkansas Power and Light Company; "Demand Meters—Application and Use," W. R. Chalker, meter superintendent, Southwestern Gas and Electric Company; "Getting Load to Safeguard Net," Edward Vennard, vice president, Middle West Service Company.

W. A. Green, manager of the Gas Department, Arkansas Power and Light Company, had charge of the Gas Section. Speakers and their subjects were: "Leakage and its Effect on Natural Gas Operation Earnings," S. R. Walker, vice president, Fort Smith Gas Company; "Distribution Problems," Carroll D. Miller, distribution engineer, Arkansas-Louisiana Gas Company; "What the Sale of Industrial Gas Means to Our Companies," F. S. Kelly, industrial engineer, Arkansas-Louisiana Gas Company; general discussion, R. A. Bautts, assistant manager, Gas Department, Arkansas Power and Light Company; "The Developments and Benefits of 'CP' Ranges," C. B. Wilson, state sales manager, Arkansas Louisiana Gas Company.

Other speakers on the general program were: Elmer F. Schmidt, vice president and operating manager, Lone Star Gas Company, who talked on "Status, Trend and Future of the Natural Gas Industry!" George A. Davis, vice president, Oklahoma Gas and Electric Company, whose subject was "After All, We are Just People;" Frank B. Long, vice president, Oklahoma Natural Gas Company, Tulsa, who talked on "Opportunities."

What Is An Integrated Electric Utility System

(*Continued from page* 32)

opments carried through on his own company's system it is possible today to clear difficulties on transmission circuits and reconnect portions of the system without any loss of "synchronism" between these portions and without any service interruption having occurred along any of the lines that participated in the break, because the whole process of opening and reclosing the line is carried out in

STAKOOL Ventilating FANS

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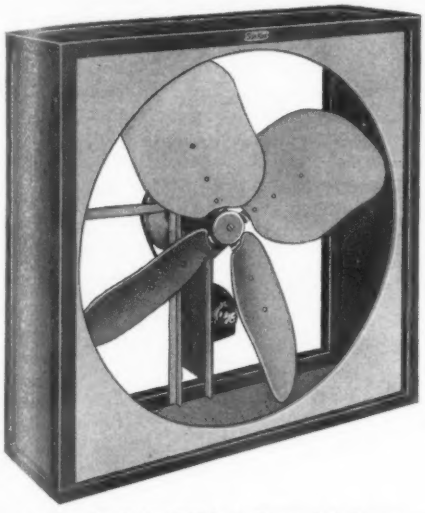

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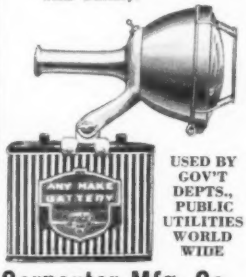
Now, extra power and brilliance of MASTER-LIGHTS give you perfect daylight working conditions in any kind of weather. Your expert repair crews need MASTER-LIGHTS for maximum efficiency. MASTER-LIGHTS have *POWER!* They give your men ALL the illumination they need on any job. They *save valuable time* for your crews in locating trouble spots. You can always depend on MASTER-LIGHTS to give you faithful service for many years. For MASTER-LIGHTS are made of solid brass, bronze and aluminum, with heavy chromium plating and are rust-proof and weatherproof. They have true, full parabolic reflectors, and cast a beam of maximum intensity and efficiency a mile or more in range. Illustrated at right is the most powerful roof searchlight made for trucks and repair cars, specially constructed for public utilities. Ideal for locating and repairing breaks in overhead lines.

Above: TYPE T Searchlight: range one mile. Light can be revolved in a complete circle, at any angle, up or down. Operates from car battery. No gears to wear or rattle.

Below: F5 Master-Light General utility, portable hand model. Height: 13". Weight: 9 lbs. Range: ¾ to 1 mile. Complete with battery.



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MASTER-LIGHTS are standard equipment with foremost public utilities corporations. As a careful buyer you will find MASTER-LIGHTS approved—from the Equipment Committee right down the line. We'll send you a sample searchlight on 30 days FREE TRIAL—and rest our case on its performance. Address:

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TEN-AMPERE TIME SWITCH

WITH SELF-STARTING SYNCHRONOUS MOTOR
Ideal for Time-Controlling
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Here is one of the greatest values ever offered in a Time Switch. Standard model for 110-volt, 60-cycle **Alternating** Current. For 220 volts, $1.00 additional. Can be furnished with extra set of trip levers for $1.00

A companion of this model is the No. 16-S, for use on 110-volt **Direct** Current, at $15. Equipped with spring-wound, ten-day precision movement.

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When you have high speed armatures to rewind, great care must be taken to guard against coil movement inside the slots. Internal short circuiting is often caused by centrifugal force acting in this manner.

However, if you use DOLPH'S SYNTHITE No. 153-Y Clear Baking Varnish and allow sufficient baking time, you need have no worry on this score. This synthetic gum base varnish holds motor windings in one solid mass preventing all possibility of throw out or coil movement.

Why not investigate the merits of this remarkable material? Mail the coupon today. Your order will be shipped subject to the DOLPH Guarantee that if the material does not prove satisfactory, it may be returned and the full amount charged will be refunded immediately.

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- CERTIFIED RATINGS your guarantee of QUALITY!
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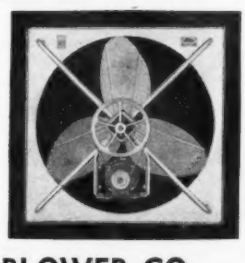

AUTOVENT FAN & BLOWER CO.
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so fast a time that even the human eye cannot perceive the fact that power has been interrupted to a lighting circuit.

All this he cited as an example of advances in the state of the art in making possible coordination and integration on a wider scale than could be effectively handled without such advances.

Mr. Sporn ended his talk by inviting those assembled for the seventh annual conference of the Southeastern Electric Exchange to inspect the facilities of the Appalachian Electric Power Company, in Roanoke, which are part of the Central System, as an example of facilities of an integrated system.

Modern Methods of Metering Refrigerant

(*Continued from page 41*)

the machine has stopped, and after the liquid level in the float chamber has been reached. Consequently the system is then operating on the same principle as the capillary tube, and as the pressures tend to equalize after the machine has stopped, the additional reserve capacity of the high side float system completely fills the evaporator and the overflow causes the suction line to frost. It is interesting to note that should the system be short of refrigerant and also have a leaking needle valve, it is possible that it will operate satisfactorily.

It appears that both the high side float and capillary tube are here to stay in so far as the metering of refrigerant for domestic refrigerators is concerned. And although a short time ago the capillary tube was considered equipment for the cheapest of refrigerators, it now appears to be proving itself as probably the simplest and most trouble free of all methods.

Understanding and Using The Electrical Code

(*Continued from page 39*)

ditional safeguards these isolating switches must be accessible to qualified attendants only, and arranged so that the load side may be readily grounded.

Quite often customers obtain service at primary voltages and then install their own transformers for reducing the primary service to lower voltages. Many utilities have a rate differential for customers who are served in this manner. Under these conditions, the customer must provide high voltage service equipment and at the same time must protect the secondaries of the transformers.

The primary service circuit breaker and related service equipment may be used as the disconnecting means and overcurrent protection for the secondary mains if the following conditions are fulfilled:

(a) The secondary windings of all the transformers must feed a single set of mains. Figure 31 shows three single phase transformers connected to feed a three-phase secondary load from a single set of mains. No service equipment is required in the secondary.

(b) The primary breaker must be manually operable from a point outside the vault. The use of a pushbutton controller operating the circuit breaker by a remote circuit does not fulfill this requirement. The circuit breaker must be set in the vault wall with the operating handle of the circuit breaker extending outside the vault, or equivalent mechanical linkage must be provided from a handle extending outside the vault to the circuit breaker within the vault, so that the primary breaker may be opened and closed by hand without entering the vault.

(c) The setting of the primary breaker must be of such value as to protect the secondary feeder. Thus, if the service shown in Figure 31 is 13,800 volts, three-phase, the total transformer kva is 1000, and the secondary voltage is 230 volts, three-phase; the primary current would be:

(1000 x 1000) / (√3 x 13,800) = 42 amps.

The secondary current would be:

(13,800/230) x 42 = 2520 amps.

The secondary mains consist of three copper bus bars ¼" x 3½" capable of carrying 2625 amperes. The maximum setting of the primary breaker, then, must be:

(230/13,800) x 2625 = 44 amps.

It should be noted that the above applies only to those installations utilizing a primary circuit breaker. In all other types of installations it is impossible to fulfill all three requirements set forth above so that the secondary circuits must be provided with proper service equipment. For example, Figure

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Every item in line of Ward Leonard Controls is an outstanding product of sound engineering, practical designing and careful manufacture . . . each planned to meet a specific set of conditions in industry. The absolute dependability and ruggedness of Ward Leonard Controls make them ideal controls to be built into machines and equipment the maintenance of which is expensive or difficult.

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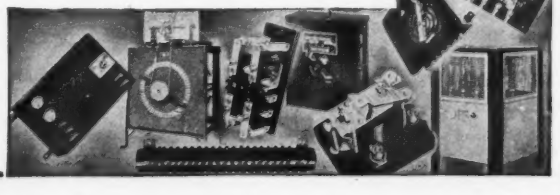

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The chief industry is cotton textiles consisting of print cloths, shirtings, yarn, twines, draperies and ducks. Other important industries are hardwood, veneer mills, furniture, printing and publishing, foundry and machine shops.

Columbia is served by four railroad systems, three of which are recognized trunk lines.

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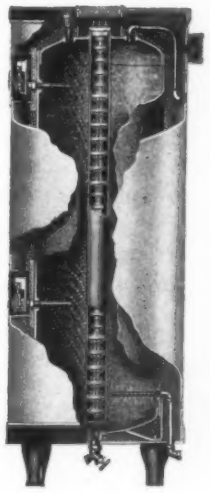

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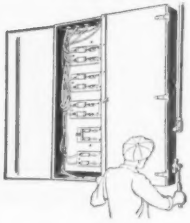
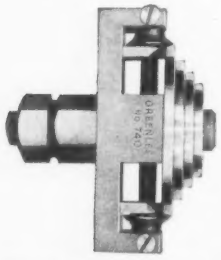
Greenlee Knockout Tools have been developed to do the job of enlarging holes easily in a few minutes. The hours of drilling, reaming, and filing, formerly required to enlarge holes on the job, are no longer necessary. These tools make the job so simple that a clean round hole to fit conduit up to 3-inches can be cut in a couple of minutes or less, by merely turning a drive nut with an ordinary wrench.

Greenlee Knockout Tools



The drawing at the left shows just one of the many uses of the Greenlee Knockout Tools.

The Greenlee Knockout Punch is made in various sizes to enlarge holes for conduit from ½ to 3-inch. Cutting is done by a two point punch, driven by screw action through the metal into a die of proper size.



The Greenlee Knockout Cutter shown here will enlarge holes to fit 1-1/2, 2, 2-1/2, and 3-inch conduit. This tool will cut easily through metal up to 1/8-inch thick in about 1-1/2 minutes.

WRITE FOR COMPLETE DETAILS

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ROCKFORD, ILLINOIS

32 shows three single-phase transformers paralleled to feed a three-wire, single-phase load. It is impossible under these conditions to set the primary breakers to protect the secondary mains unless the capacity of these mains are decreased. This of course would defeat the purpose of paralleling the transformers, i.e., to increase the total available capacity to an amount larger than one of the transformers is capable of supplying.

The same is true for Figure 33. Here two sets of mains are taken off the transformers to feed two separate distribution centers. Again, it is impossible to protect both secondary mains with the primary circuit breaker without decreasing the capacity of either circuit.

(This completes the discussion of Article 230 on services. An attempt has been made throughout to indicate the changes as they may be included in the 1940 Code. As soon as this new Code is available, the new changes will be analyzed and presented in a later discussion.)

Organizing Promotion For Rewiring Market

(Continued from page 17)

an attractive market for additional labor hours by producing jobs which otherwise could not be obtained due to cost.

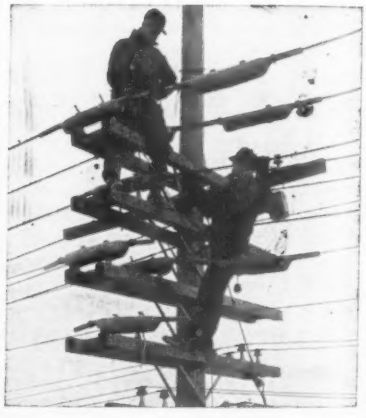
An electrical industry meeting is helpful, so that the program can be explained in detail to all interested groups. In this connection attention is directed to the pamphlets, "Basic Factors of Adequate Wiring" and "Commercial and Industrial Building Rewiring Market," published by Edison Electric Institute. These give a full description of the new materials, indicate where they can be obtained, their advantages, how to use them, etc. They are excellent pieces to distribute locally as informational material.

The Institute Wiring Committee has developed several natural color Kodachrome slide talks on commercial rewiring, complete with script. These showings are adaptable to various industry and customer groups, and are excellent for the meeting mentioned above.

(4) While these preparations are under way, arrangements should be made with local wholesale supply houses to stock the new wiring materials. All are regularly available in the branch circuit sizes, while one is recognized also in sizes to 4/0 for feeder and service work. It is understood that one type can be obtained on special order in larger sizes for heavy feeder work. Local warehousing is important as it is discouraging to sell a rewiring job and then discover that four weeks are necessary to obtain the materials. If stocked locally, wholesaler salesmen will encourage contractors to use the new wires.

(5) It is, of course, necessary to tell the prospects all about it, so as to interest and sell them. The promotion can well employ advertising to certain groups such as owners and managers of large office buildings, to department stores, school boards, superintendents of institutions, etc. An excellent broadside has been developed and is available from E.E.I. This is partially reproduced here. It points out the tremendous increase in capacities now possible in existing conduits, stressing the fact that most of the original investment in the wiring installation is still useful and can be salvaged.

Reprints of articles on office



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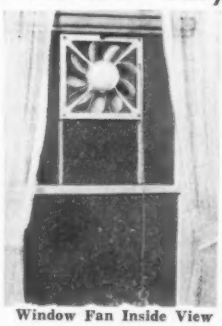
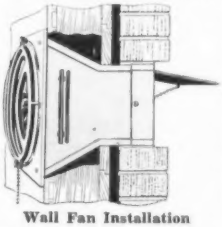


Window Fan Inside View



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building rewiring that have appeared in *Buildings and Building Management,* and in *Skyscraper Management* are available and make good mailing pieces or hand-outs for personal calls.

Naturally personal sales effort on the part of utility company people, contractors and the trade generally is necessary with the individual customer. Several aids are available so that the salesman does not appear empty-handed. One of these is a sample kit as shown in an accompanying illustration.

Some utilities have provided these for their men and at least one manufacturing company makes kits available to its own organization. They contain short lengths of ½ inch and ¾ inch conduits with various types of thin-wall insulated wires bundled together to indicate the increases in capacity possible with different combinations. It is expected that similar kits will be available shortly through Edison Electric Institute. Such graphic selling should not be overlooked. Even though a tailor-made container and nicely bundled and labeled wires may not be immediately available, the salesman can always slip a 4 inch length of ½ inch conduit and some wire samples into his pocket when making a call.

Another useful sales tool is the voltage drop demonstrator. Several are available—both originally developed by wire manufacturers. One is sold direct by the manufacturer, the other one through an outlet in the Middle West. They make possible an across-the-desk visual demonstration of the effect of voltage drop in reducing lighting output, in increasing losses and make possible an evaluation of the losses for the customer. Although objection to their use has been raised in certain areas, other groups have found them quite effective.

(6) In looking for prospects, it is desirable to concentrate first on vulnerable spots. An immediate prospect list would be those customers for whom relighting or rewiring proposals were prepared but where the sale did not mature because of cost. Such proposals can now be revived, and the prospects again interested, since with the new materials, the rewiring in most cases can be done at a cost which the owner or tenant feels justified in paying.

Certain groups as a whole lend themselves readily to promotion. Among these are office buildings, schools and department stores because of the recognized value of high levels of lighting from the standpoint of rentability of space, eyesight conservation, and saleability of merchandise, respectively. It is surprising, however, to note the wide variety of jobs that will come to the surface when promotional work is actually begun. The first ten installations proposed and sold in one area, for instance, included high schools, grade schools, retail stores, manufacturing areas of industrial plants, offices and shipping rooms.

(7) It is desirable, if not practically essential, to offer a complete wiring layout service so that all contractors bidding on an installation have detailed knowledge of sizes and types of conductors and conduits, changes in panelboards, etc. It also provides the successful bidder with a working plan to follow in making the installation. The layouts need not be elaborate but they should be complete and accurate.

A sample of a type now in successful use is shown here. The important points are clearly and definitely to indicate conduit and wire sizes. Conduit fill tables that can be used as a basis of design will be found in the E.E.I. publication mentioned previously and are also available in the advance printing of the 1940 National Electrical Code which can be secured from the National Fire Protection Association, 60 Batterymarch Street, Boston.

(8) It is desirable in each case to design the new wiring system for the greatest increased capacity that is possible with the existing conduits, so that future load increases are not again handicapped by lack of copper. The cost of doing this is slight when compared with the cost of doing the job over again five to ten years from now. It is an added service to the customer to provide him with the maximum wire capacity at this time, even though this is double that required for the new lighting installation, or whatever the increased use may be.

(9) The 1940 Code will not recognize the use of an uninsulated neutral either for branch circuit or for feeder work, (except as now

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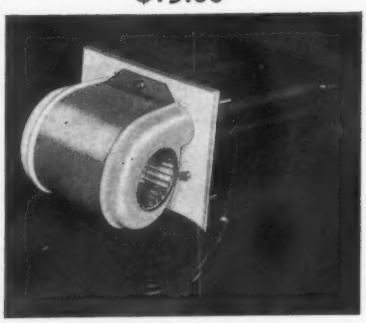
$15.00



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P. R. R. & Eighth St. Frederick, Md.

permitted in the 1937 edition). In many cases the additional copper required can be installed by using fully insulated neutrals.

In some instances, however, there will not be sufficient conduit space even with thin-wall conductors of the smallest overall diameter, if the neutral is insulated. This will be found to apply particularly to feeders. Hence, the use of the common uninsulated ground wire should be considered where essential. In many cases it will be found that regulatory authorities will give permission in an individual case where the job cannot be done in any other fashion.

(10) In approaching the market it must be remembered that the customer is not interested in additional copper capacity as such. This is important enough to reiterate. The wiring highway is merely a means to an end and has no value except to make the use of electricity possible in an economical manner. Hence, the manner in which the customer will benefit by increasing his electrical use must be stressed. Improved lighting is the common and most usual approach.

In other cases thin-wall insulated conductors make possible the sale of air conditioning equipment, modern motor equipment, commercial cooking devices, of ventilation and of a multitude of other electrical items.

Again, installations will be found where rewiring produces benefits of its own accord, such as the elimination of hazards by relieving heavily overloaded circuits, reduction in voltage drop thereby increasing light output without a corresponding increase in the monthly electric bill, or increased output in industrial plants due to better operation of motors when poor voltage conditions are rectified. These approaches will be valuable in individual cases.

In closing, it should be stated that the new materials and methods are another tool further to develop the electrical market. They are not an open sesame and are not a panacea for all the ills of the electrical industry. Their value in any given locality will depend entirely on the promotional effort put behind them. They are tremendously valuable if properly used.

Selling Industrial Lighting and Wiring

(*Continued from page 20*)

he can build up confidence with his prospect. Being thoroughly familiar with the various types of lamps on the market, he can perhaps suggest savings to his customer by using the proper lamp for the job. This leads to an opportunity to suggest new lamps for old jobs. The new infra-red lamps or drying lamps as they are popularly called, has many applications which it can perform to better advantage than present methods and is an excellent load builder. The low cost of electrical service permits these lamps to be used with economic advantage to the industrial executive. These lamps are new and, therefore, fit into a power salesman's kit of industrial tools and especially when he has sold himself as a competent lighting specialist to his prospect.

Of course, when selling lighting the more a salesman can know about the subject the better and quicker he can convince his prospect. However, the power salesman should not feel that he must be an illuminating engineer in order to sell lighting. If he acquaints himself with the fundamentals of light and the Science of Seeing, together with a fair knowledge of lighting equipment, he will be able to do a very creditable job. The excellent bulletins provided by the lamp and lighting equipment manufacturers are full of helpful information which with a little study and discussion with lighting representatives will give the salesman a background so that he can make a good presentation. It is imperative that every salesman who is selling lighting be equipped with a light meter. For those who wish to go into the matter more deeply the visibility meter and the brightness meter are valuable assets.

When selling lighting, salesmen should constantly keep in mind that the prospect is not so much interested in purchasing lighting equipment, lamps, wiring and other materials that make up the lighting system, but he is infinitely more interested in purchasing *the results* which the lighting system can produce.

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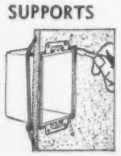

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